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ABSTRACT

This report documents the observations and findings of a research study which was conducted in Indonesia, Chile, and Peru between January and June 1989 to discover the status of educational technology in primarily formal education settings in each country. The five stated objects of the study were: (1) to determine the extent of educational technology in each country; (2) to identify the networks, if any, through which concepts of educational media and technology have been disseminated; (3) to determine reasons for the acceptance and rejection of educational technology; (4) to test a series of hypotheses pertaining to the adoption and implementation of educational innovations; and (5) to make cross-cultural comparisons of all previous objectives to determine the extent to which each element is evident in the cultures being studied. The conceptual framework and methodology are set forth in the introductory chapter, which is followed by separate chapters devoted to each country. The final chapter summarizes the study, makes cross-cultural comparisons, and draws conclusions about the hypotheses. Both English and Spanish versions of the questionnaires used in Chile and Peru are included. (16 references) (DB)

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THE DIFFUSION AND IMPLEMENTATION OF EDUCATIONAL TECHNOLOGY IN DEVELOPING NATIONS: CROSS-CULTURAL COMPARISONS OF INDONESIA, CHILE AND PERU

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FORWARD

This report documents the observations and findings of a research study conducted in Indonesia, Chile and Peru between January and June, 1989. It is an attempt to discover the status of educational technology in each country at that time and to determine reasons for its acceptance, rejection or limited growth. It also explores a series of hypotheses about the conditions which facilitate the implementation of educational technology in developing countries.

The conceptual framework and methodology is set forth in the introductory chapter. Then one chapter is devoted to each country and a final chapter is a summary of the study with cross-cultural comparisons and conclusions about the hypotheses.

There is a limited distribution of this report because it is more a collection of personal field notes than a document that has been prepared for publication and widescale distribution. There is some historical data, particularly about the growth of educational technology in Indonesia, to provide a long-term perspective about the development of the field in that country. The generalizations that stem from this study are published in the journal literature of the field.

The author would like to acknowledge support from the Midwest University Consortium for International Activities (MUCIA), contractor for The World Bank project which supported travel to Indonesia; the Council for the International Exchange of Scholars (CIES) for a Fulbright award for Research in the American Republics; and to Syracuse University for a research leave during the period of the study.

Donald P. Ely

Syracuse, New York
November, 1990

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CONCEPTUAL FRAMEWORK

This is a status study. It reaches back to the early 1960's as educational technology was being introduced in many parts of the world. It is an attempt to document some of the successes and failures of this movement as it was introduced in two areas of the world: Southeast Asia (Indonesia) and Latin America (Chile and Peru). The primary question, and the one from which all others emerge is, "To what extent has educational technology been accepted in educational settings throughout the countries studied?"

For more than a quarter Century, the field which began as audiovisual education gradually went through several metamorpheses, eventually became educational technology, and has been spreading throughout the countries being studied. It has been introduced through a variety of projects supported by many international and bi-national organizations. The spread has been largely non-systematic and its manifestations have focused largely on schools and universities as well as on the public sector. This study emphasizes the formal education settings as well as some of the non-formal sites in which the concepts and products of educational technology have been adopted and implemented.

The first objective is to determine the extent of educational technology presence in the country. Where are the centers of activity? Who leads them? How long have they been in operation? What do they do? What changes have occurred over the years? Do they appear to be secure for the foreseeable future?

A second objective is to identify the networks, if any, through which the concepts of educational media and technology have been disseminated. Who are the opinion leaders? Are they associated with the primary nodes of the networks? Are people associated with one agency, program or organization more likely to be the source of innovative ideas and responsibile for spreading those ideas throughout the country? Are there formal channels, such as professional associations, publications or meetings where many of the same people communicate with one another? Are there organizations that assume dissemination responsibilities for the nation? for a region? for a select group of decision-makers? Do any social networks exist among opinion leaders and gatekeepers?

A third objective is to determine reasons for acceptance (and rejection) of educational technology. Also of interest is any change that may have occurred between initial acceptance and later rejection. Why did the change occur? To what extent did financial support determine acceptance or lack of support, rejection? What factors were responsible for continuation?

A fourth objective is to test of a series of hypotheses that have been generated over

the years and pertain to adoption and implementation of educational innovations. These are the conditions that facilitate change. Most of the conditions stem from the higher education literature in more developed countries and from personal experience of the author. Further validation would confirm, reject or modify the conditions as they are viewed in other settings and sectors. The basic hypothesis is that the presence of eight conditions is necessary to implement change once an innovation (or a new practice) has been introduced and adopted. The presence of all eight conditions would indicate high probability of sustained implementation leading to institutionalization. Any reduction of conditions would lessen the probability of continuation. Presence of two or three conditions would probably signify weak implementation and less liklihood of continuation. No ranking of importance for the conditions has yet been determined. There may be such an order but the question has not been studied nor is it part of this study. The conditions are:

1. Dissatisfaction with the status quo;
2. Knowledge/skills to perform the new practice;
3. Rewards/incentives for acceptance and continuation;
4. Time to plan and implement;
5. Resources to use in the implementation;
6. Leadership in introducing and continuing the new practice;
7. Commitment on the part of everyone involved; and
8. Participation in the process.

The fifth objective is to make cross-cultual comparisons of all the previous four objectives to determine the extent to which each element is evident in the cultures being studied.

Methodological Framework

This study blends elements of historical, case study, descriptive, and impact evaluation methodologies. The nature of the purposes and the unique experience of the researcher dictate a multiple approach for this study. The close relationship of each question being studied calls for multiple means of collecting and analyzing data. It is hoped that clarity will emerge as each objective is pursued in depth.

The historical dimension emerges from more than 30 years experience by the researcher in monitoring the development of the field in Indonesia, more than 25 years in Chile and 14 years in Peru. Thus baseline data are available and can be traced over time to the present so that current data can be compared with earlier information. Some of the people interviewed also have a longitudinal perspective and can provide "then and now" comparisons.

The case study aspect refers more to the nature of sources consulted and the visible dominance of one organization (PUSTEKOM in Indonesia, ACHTE in Chile,

and the INIDE in Peru). These agencies played major roles in the diffusion of educational technology throughout their respective countries and are described in some detail as case studies.

The descriptive dimension comes from interviews with various people who have had key roles in the diffusion of educational technology throughout each country. An interview schedule and questionnaire provide systematic inquiry that can be used in the over all analysis. Some of the data are quantitative but most are impressionistic.

Impact evaluation is usually a team-based procedure but certain aspects of this approach (White, 1986) are incorporated into the above procedures, e.g., beneficiaries, social and economic impact, political impact, technological impact, and sustainability. Many aspects of impact evaluation could be called descriptive because the ultimate data are derived by descriptive procedures. There are elements of case study methodology imbedded in its procedures.

The procedures yield a type of multiple operationalism with increasing confidence stemming from each additional source and procedure that produces confirming data. From this standpoint alone, especially with one researcher, the mix of procedures appears to offer reliable information that no one approach would provide.

Evidence Sought

To accomplish each of the objectives, a series of hypotheses have been generated to guide the research process. These hypotheses come from the literature of diffusion of innovations and from the personal experience of the researcher. They are the basis for the questionnaire and interview schedule and are directly related to the objectives of the inquiry.

	Questionnaire No.	Objective No.
1. There is agreement about the definition of educational technology in the country.	1,2,4	1
2. There are people who consider themselves to be in the field of educational technology.	1,3,4	1
3. Educational technology programs exist and have been institutionalized.	6,9	1
4. There are opinion leaders who have been responsible for the diffusion of	5,7,10,11	1

educational technology.

5. There are definable networks through which information flows	7,8	2
6. Adoption and continuation of educational technology exists when there is: a. Dissatisfaction with the status quo b. Knowledge/skills c. Reward/incentive d. Time e. Resource allocation f. Leadership g. Commitment h. Participation	12,13	3,4
7. Documentation regarding educational technology development exists.		1

Data Collection

Each of these hypotheses will be treated separately using data gathered from questionnaires, interviews, inspection of documents, and observations. Much of the data has been accumulated from a 30 year association with educational technology development in Indonesia; 25 years in Chile and 14 years in Peru. Since 1979, the researcher has been in Indonesia seven times from periods of three weeks to three months. The intensive part of the research was conducted in January and February 1989 during a World Bank assignment in that country. The researcher held a Senior Fulbright Lectureship in Chile in 1963 and in Peru in 1975. The intensive part of the research for this inquiry was conducted in May and June 1989 with a Fulbright award for research in the American Republics.

Data Analysis

The data from questionnaires, interviews and documents were reviewed in terms of each research objective for each country. Individual country reports were submitted to professional educational technologists who had lived and worked in each country for many years, some native citizens and some U.S. citizens. Each person reviewed a draft of the manuscript for the country with which s/he was associated and corrected errors of fact and questioned statements of judgement. These critiques were taken into account as revisions of each country's report were made. A second step was to make cross-country comparisons for each research

objective.

Limitations

One person's perspective is just that--the view of a single individual with biases, personal preferences, and finite time to devote to a single study. When the perspective is that of a quarter century or more, there may be an averaging of the highs and lows of viewpoints over that period of time. There is likely to be an affinity for the countries involved or else relationships would probably not have been continued. This affinity may make allowances for abberations that a less sympathetic observer would point out. The difference between empathy and cultural sensitivity are probably not too great but must be recognized. In this case, the researcher's cultural sensitivity does yield a certain amount of empathy and therefore some of the conclusions must be interpreted in that light.

For this type of study, one is never sure that s/he is speaking with the "right" people or that a sufficient number have been reached to permit certain generalizations to be made. By following networks, isolated individuals might be neglected. By concentrating efforts in capitol cities, findings tend to reflect a more urban orientation and more of a "party line" when it comes to expressing opinions about the "state-of-the-field". These limitations are very real.

While recognizing the limitations, there has to be some recognition of the time and effort that a professional has put into the transfer of knowledge to another country. Teaching many students from the countries being studied here and following developments from those countries through the professional literature, sustained correspondence, and through visitors from these areas, some understanding of and appreciation for the growth and development of the field in these countries is bound to occur. In this case an "expert witness" should reflect some credibility.

INDONESIA

Introduction

At the end of a study, it is sometimes helpful to write the conclusions first, as an abstract or advance organizer. Let this summary be the introduction. For further details, the body of the paper will expand upon each conclusion and provide the rationale for the opening statements.

1. There is general agreement about the definition of educational technology.
2. There are people who consider themselves to be in the field.
3. Educational technology programs do exist in the Ministry of Education and Culture, in other government agencies, in universities, and in the public sector.
4. There are opinion leaders who have been responsible for the diffusion of educational technology; they are Prof. dr. Yusufhadi Miarso, Prof. dr. Setijadi, and Prof. dr. Santoso Hamijoyo. Some foreign experts have made special contributions to the diffusion of educational technology concepts.
5. There are diffusion networks through which educational technology information flows. The major network is made up of Syracuse University graduates who completed Master's degree programs in 1978.
6. Most of the conditions that facilitate adoption and implementation of educational innovations are present in the case of educational technology; where such adoption and implementation have not occured, a "lack of understanding about educational technology" was most frequently mentioned reason.
7. Documentation regarding educational technology in Indonesia does exist in various locations.

There is general agreement about the definition of educational technology in Indonesia.

There is probably no place in the world that has universal agreement about the term, "educational technology". Indonesia is no exception. Most people think of it as products--the "hardware" and "software" of the education and training industry. This interpretation is partly due to the audiovisual education movement which began in the late 1950s. It has been reinforced by the "hi-tech" orientation brought about by the use of the Palapa satellite and the use of television for educational purposes. These "delivery systems" are visible; people consider the symbol of media as the focus of the educational technology field just as they do in most other parts of the world. In the United States, a 1970 report of the Presidential Commission on Instructional Technology began by noting the two definitions of instructional (educational) technology; one highlighted the products while the other described the process. Seven years later, the national professional association in the U.S. published The Definition of Educational Technology (AECT,1977) which was later

translated into Bahasa Indonesia and is widely used today in professional education programs that prepare individuals for the field. The current status is very much like other countries: there is a large residue of the audiovisual (or product) emphasis among educators in general and, to some extent, among some professionals. There is a substantial move toward the process definition as exemplified in the recent charter of the Professional Society for Educational Technology (IPTP) which held its first national conference in February, 1989. The fundamental concept of the Indonesian Open University (Universitas Terbuka) is based on the process (or systems) concept of eductional technology and this fact should go a long way to help people outside the field to know and understand the contemporary definition of the field.

A matter of continuing concern is the "lack of understanding" about the field. During interviews, when individuals were asked for reasons for rejection of educational technology in places where it was considered but not adopted, the most frequent answer was "lack of understanding". This "lack" referred to the interpretation (or definition) of the field. There clearly is much to be done in communicating the purpose and meaning of the field among decisionmakers in education and related areas. The Open University may help in this process and the professional preparation of people to serve in the field will also yield a new generation of practitioners who will demonstrate the new interpretation.

There are people who consider themselves to be in the field of educational technology.

There is no easy way to count the numbers of people who consider themselves to be in the field. The people interviewed for this study were lecturers in educational technology at various colleges of education (IKIP), designers and developers of training programs, consultants on curriculum development, trainers, media producers, and teacher educators.

More than 200 people attended the first national conference on educational technology held in Jakarta in February, 1989. Apparently, they considered themselves to be sufficiently related to the field to spend several days at the conference. The establishment of the National Professional Society for Educational Technology during that conference is further evidence that there are sufficient numbers to organize such an association--a sure sign of professionalization.

Another factor that helps to establish the field is the presence of academic programs in educational technology in seven universities: for "bachelor's level" (S1) programs, IKIP Bandung, IKIP Jakarta, IKIP Padang, IKIP Semarang, IKIP Surabaya, IKIP Ujung Pandang, and IKIP Yogjakarta; for "master's level" (S2) programs and "doctoral level" programs (S3), IKIP Jakarta and IKIP Malang. The

establishment and maintainance of such programs is presumably based on a need for personnel to staff educational technology positions. There have been some recent cutbacks because of budget reductions but the programs continue to be maintained.

Educational technology programs exist and have been institutionalized.

What is an "educational technology program"? It is an unit, agency, department or entity whose purpose is to improve and/or support the quality of teaching and learning through the systematic design and delivery of instructional materials and processes. Such programs exist on the national, regional, provincial, and local levels and are administered by personnel who have been trained to provide services to instructional personnel and students. The services of such units may provide internal support for an organization or they may offer services to external clients. They exist in several sectors, e.g., education, business & industry, government, military, social services, and non-governmental non-profit organizations.

One of the most obvious places to look for educational technology is in education settings--schools, universities, and the Ministry of Education and Culture. These were the starting points when the first concepts of the field were introduced. The Indonesian Ministry of Education and Culture encouraged the development of educational technology through the establishment of an Institute of Educational Media as part of the Office of Educational Development in 1970, even though there had been some modest beginnings in some parts of the country before then. The Audio Visual Center at IKIP Bandung had an active program in the late 1950s.

The first attempt to introduce educational technology on a national scale was with the establishment of Project TKPK (Educational Communication and Technology) in 1975. As a project within the national center for research and development in education (BP3K) of the Ministry of Education and Culture, the program received national visibility and support from the Director of BP3K and the Minister of Education. From a modest beginning, in modest quarters, the project became a more permanent "center" in 1978 with new facilities and expanded staff, with a broader orientation beyond Education even though the Center was still under the Minister of Education and Culture. In 1983 the center received a new designation, PUSTEKOM (Center for Communication Technology), under the Director of the Educational Research and Development Center, now called BALITBANG DIKBUD. The current Director, Sudarsono, continues the operation which has changed focus to more of a production center, even though several innovative programs in the schools operate through PUSTEKOM, such as the SMP Terbuka, the Open Junior High School. PUSTEKOM is clearly one of the most visible and established entities for educational technology in Indonesia. Almost every person interviewed indicated that this Center was one of the major centers of activity in the country. The Director seems to be optimistic about its future even

though new programs seem to be fewer and the innovative spirit appears to have diminished.

A second national institution that exemplifies the adoption and implementation of educational technology is the Open University (Universitas Terbuka). From the very beginning of the planning in 1982, the key personnel for the Open University have been drawn from the field of educational technology or closely associated fields. The Rector, Dr. Setijadi, was the head of BP3K when Project TKPK was started. The Vice Rector III, Dr. Atwi Suparman, received his Master's degree in Instructional Technology from Syracuse University and his Ph.D. in the same field from IKIP Jakarta. The Director of a major program housed at the Open University (Inter-University Center for the Improvement and Development of Instructional Activities) is Dr. Yusufhadi Miarso, who inaugurated Project TKPK and eventually became the first Director of PUSTEKOM. With this influence, it can clearly be seen why the Open University has embraced the systematic design and evaluation of instruction and a management support system based on concepts of educational technology. The use of various media in the delivery of instruction is further confirmation that educational technology is fundamental to the operation of this innovative institution that opened in 1984. Located at a new site in Pondok Cabe, south of Jakarta, the Open University is now the largest tertiary institution in the country with an enrollment of 136,000 students in 1989.

A third national force is that of education by radio. Even before the establishment of a national center in 1975, UNESCO had supported the training of selected educators to become educational radio producers, planners and writers. The need to upgrade and update large numbers of primary school teachers in the early 1970s brought about the use of radio for teaching primary teachers at a distance--a precursor of the Open University! Centers for the design, writing, production, and transmission of courses for primary school teachers were established in Semarang and Yogjakarta under the umbrella of Pusat TKPK (Center for Communication Technology). Television has not been used for instructional purposes, except for occasional Open University programs that supplement the courses but are not integral to them.

As one of the first countries to launch and use satellite communications, it is understandable that some satellite use should be for educational purposes. EArly encouragement (and some funding) by USAID to use the satellite for education was rebuffed by Indonesian educators who maintained that teachers were not yet ready to use hi-tech to teach. It never has reached the primary and secondary schools, but for higher education there have been some uses. One of the best and most visible still continues today but at a reduced level over 1987 when it was in full operation. The Eastern Universities Satellite Consortium (SISDIKSAT) receives programs (courses, lectures, resource material) from the IPB campus in Bogor. Sulawesi, Irian Jaya, and Kalimantan are involved in this program. Other uses are made of satellite

commuication for education. They are described in an excellent article by Johari and Shaw (1987).

There are educational technology activities in operation at many of the universities. One cluster would be those IKIPs (Institutes of Teacher Training and Education Science) that are training individuals for professional positions in the field. Seven IKIPs offer undergraduate programs (S1) in educational technology: Bandung, Jakarta, Padang, Semarang, Surabaya, Ujung Pandang, and Yogjakarta; two offer master's degrees (S2): Jakarta and Malang and only Jakarta offers the doctorate (S3). Most of the IKIPs have Learning Resource Centers that were established by a project under the Directorate General of Primary and Secondary Education in the early 1980s. These LRCs are attempts to provide media services to lecturers who will eventually demonstrate their "proper" use in the classroom. One of the most comprehensive and well-run LRCs is at IKIP Surabaya. During 1988-89 there has been an intensive effort on the part of the educational technology faculties to revise the curricula to more accurately represent current developments in the field.

Other universities constitute clusters of innovative but independent efforts to use educational technology in creative ways. Satya Wacana University in Salatiga, Central Java, is known for its innovative programs using various aspects of educational technology. They installed and perfected the use of the language laboratory in the early 1970s and created a media center for the production and distribution of nonprint materials to teachers and students. The University Sebelas Maret in Solo, Central Java, has adopted the creation and use of self-instructional modules patterned after the Project Pamong procedures used with primary school children. The University currently has more than 2,000 self-instructional modules for use by its students and they are being sold for use at other universities. These modules are developed using the principles of systematic instructional design. The Institute of Technology in Bandung (ITB) has had an internal commitment to improve the quality of instruction through the use of educational technology products and processes. They developed pilot videodisc programs in 1983-84 and continue to explore the instructional applications of microcomputers. Most of the effort seems to come from within the University.

A relatively new, but rapidly spreading instructional innovation is the Applied Approach (AA) being propogated by the Netherlands University Foundation for International Cooperation (NUFFIC). The Applied Approach is basically an instructional development procedure to restructure courses by the lecturers themselves. After a one week training program and a two week work period with local tutors, courses are redeveloped according to a seven step process that incorporates tested principles of teaching and learning. Extensive training materials, manuals, and methods have been created, tested, and implemented in eleven public universities with many more scheduled to be covered in 1989-90. The AA program operates out of the office of the Director General (Academic Affairs) of

Higher Education.

The Indonesian Armed Forces, especially the Air Force, have been using instructional technology in their training programs since 1978. They adopted the instructional design model of the United States Interservice Procedure for Instructional Systems Development (IPISD) and are currently developing extensive applications for armed forces training.

There seems to be little evidence that educational technology has made any impact on primary and secondary education except for a few isolated projects such as Project Pamong and the Open Junior Secondary School mentioned earlier. These programs sponsored by "outside" organizations are attempts at solving the shortage of teachers and the lack of classrooms. They are pilot or experimental in nature but have lasted over the years in a fully implemented state. Project Pamong has been modified and adapted to changing local conditions and SMP Terbuka (Open Junior HIgh School) continues using the same basic materials developed in 1984-85. The only impact is in the areas where the programs are still operational.

Two centers, funded by foreign govenments, continue in operation after many years: the Multi-Media Center in Yogajakarta and the Science Teaching Center in Bandung. Each has an educational technology orientation; each exists as an independent unit with no official tie to the national education establishment.

Mention should be made of several organizations outside the sphere of formal education that draw heavily upon the products and processes of educational technology. They are operated by individuals who have been trained in the field of educational technology and follow the principles of instructional design and development largely in nonformal settings. The National Family Planning Board (BKKBN) is one of the largest users of instructional media and development in their training programs. About a dozen people have been awarded Master's degrees in educational technology and use concepts from the field in their daily work. The National Banking Training Institute (LPPI) employs professional educational technologists in its national center. They have incorporated many of the more sophisticated processes used by professionals in the field such as needs assessment, computer-based instruction, and distance learning. The Department of Public Works (PU), the National Department of Health, the Police Department and the Rural Development agency (NDU) all use educational technology principles but the source of personnel is not clear.

The institutions, agencies, and programs listed above is not exhaustive. It is a good sample of educational technology activities in Indonesia as of early 1989. When one considers the state of the field in the late 1950s and early 1960s, much progress has been made. To answer the question regarding the extent of educational technology adoption and implementation, one would have to conclude that the

field is "alive and well". Could it be more integrated? More extensive? More obvious? Of course, but the fact is that the field is established and recognized by many people inside and outside of Education. There are several other indicators which point to successful adoption.

1. A national professional society has been established with an initial membership of over 200 members.
2. Publications in Bahasa Indonesia have been created by original writings and by translations.
3. Curricula to prepare professionals in the field has been developed at the undergraduate and graduate levels.
4. A national center (PUSTEKOM) has been established and has been fully operational for about ten years.
5. The field has had an impact on sectors outside the field of education thus legitimizing its existence.

<u>There are opinion leaders who have been responsible for the diffusion of educational technology</u>.

In considering the people responsible for the diffusion and implementation of educational technology, there are clearly three distinct groups:

1. Those who were (and are) the active "movers"; individuals who possess a vision about what the field could contribute to the country and have take steps to promote the acceptance of educational technology concepts;
2. Those individuals in the higher eschelons of government and universities who are strong advocates for educational technology and who, by their decisions and actions, have served as innovators and promotors of innovation; and
3. Individuals from other countries who have been invited to help in the diffusion, application, and institutionalization of educational technology; people who are experts in the field and who usually team up with Indonesian counterparts for the purpose of advancing the message of educational technology throughout the country.

<u>Internal Change Agents</u>. The name of Yusufhadi Miarso was spontaneously and unanimously mentioned as the person who has exerted more leadership and has had the greatest influence on the growth and development of the field in Indonesia. His name was so ubiquitous that one is tempted to write a biography of Yusufhadi Miarso to tell the story of educational technology development in Indonesia rather than to go through the procedures that have been used in this study. His name is closely associated with his mentor, Santoso Hamijoyo, who first urged Yusufhadi Miarso to continue professional study in the field. And closely associated with both Miarso and Santoso, is Setijadi, who worked with them on innovative many

projects, programs, and centers of activity related to the field. The study of internal leadership then is the story of these three invididuals. To be sure other were mentioned (and they are indicated at the close of this section) but the frequency of mention calls for further explanation of the roles and activities of these three leaders.

Yusufhadi Miarso is currently head of the Inter University Center for the Improvement and Development of Educational Activities, a major national center aimed at improving the quality of teaching and learning in higher education institutions. It is sponsored by the World Bank. He also serves as a Professor at IKIP Jakarta. His most recent previous appointment was Director of the Center for Communication Technology (PUSTEKOM) which is under the direction of the Ministry of Education and Culture and serves schools and universities on a national level.

Yusufhadi Miarso received his "Baccalaureat" from Airlangga University in Malang in 1958; his Master's Degree in Instructional Communications from Syracuse University in 1963 and a doctorate from IKIP Malang in 1985. He was appointed University Professor at IKIP Jakarta in 1988. His professional life has been filled by travels to many lands, representing the Government of Indonesia on matters of educational technology, and by honors, such as the Distinguished Serve Award for Outstanding Activities and Achievement in Educational Technology from the Association for Educational Communications and Technology (AECT) in the United States--the only non-American to receive this high award.

Yusufhadi Miarso has been the Indonesia representative to conferences and meetings in Japan, The Netherlands, United States, Malaysia, Singapore, France, India, and the Philippines. He has served on the Board of INNOTECH, an agency responsible for introducing innovative programs in education throughout Southeast Asia. He has directed projects sponsored by UNESCO, UNICEF, UNDP, USAID, and the World Bank.

As the major innovator in the field in this country, he has been responsible for writing or translating more than ten books in educational technology and has written journal articles in English and Indonesian for professional journals serving both local and international audiences. He has provided input regarding educational technology for each of the five pelitas (5-year plans) that serve to guide the national planning effort. He is a consultant to such national organizations as the National Banking Institute, the National Family Planning Board, the Post and Telephone Agency and has lectured in most of the major universities in the country. He served as the first executive director of the National Professional Association in Educational Technology.

Beyond this distinguished career is a person whose life exemplifies that of a

leader, change agent, opinion leader, and innovator. His interest in the field by stimulated by Santoso Hamijoyo who had started an Audiovisual Center at IKIP Bandung about 1958. When Yusufhadi went to Bandung, he met Murray Thomas who was there as an advisor on a Ford Foundation project in teacher education managed by the State University of New York. These two men, along with Sadarjoen, Rector of IKIP Bandung, made a considerable impact on Yusufhadi and he decided that this was the field he wanted to enter. He came to the United States in August, 1961 to study at the State University of New York at Oswego but transferred to Syracuse University the next month and stayed until he was awarded his Master's Degree in May, 1963. It was Santoso who encouraged and assisted him to make the move to graduate study, aided by Thomas' recommendations.

When Yusufhadi returned to Indonesia, he came under the care of Setijadi, who had finished his doctorate at Cornell University. Setijadi headed a program which was a National Assessment of Education (BPP), sponsored by the Ford Foundation. He invited Yusufhadi to help formulate plans for the first Pelita (Five Year Plan) which began in 1968. Since one aspect of that plan was to use the mass media of communication, a team of three Indonesians sent to Australia in 1969 to study broadcasting planning and management: Yusufhadi studied planning, Sinwari concentrated on data collection procedures, and Paul Surono on radio production. Sinwari later became Yusufhadi's Secretary (Administrative Assistant) and Surono was named Head of the Radio Production facility in Yogajakarta, which was part of PUSTEKOM. Radio was designated as the primary delivery medium for primary school teacher upgrading in the 1968 Pelita and, by 1970, there were two production centers: Yogajakarta and Semarang. There was a separate, but related center in Irian Jaya.

Yusufhadi was appointed Director of the Center for Educational Media in 1970 and in 1971, he became Deputy Director for Development of the BPP. He served on the national team to develop a preinvestment study and proposal for using the forthcoming satellite in 1972. The Second Pelita (1973) specifically stated that the satellite would be used for educational purposes and this intent was underscored by President Suharto on 16 August 1975 and 16 August 1976.

Preparation for the era of the satellite, which the 1970s could be called, was marked by UNESCO artivities in the late 1960s. Yusufhadi Miarso was right in the middle of that effort. In 1968, UNESCO sent a consultant named Emerson who recommended in a report that radio be used as an instructional medium. In 1969, the Ford Foundation sent an Australian named Koch to work on radio development. Yusufhadi was his counterpart. About that time a man named Willing led a UNESCO team studying the use of mass media and ultimately recommended that 24 more studies be conducted. At the time the Palapa satellite was launched for Indonesia in 1975, Gordon Law and Lee Campion, U.S. consultants, were working in Indonesia for UNESCO and helped to create the first

proposals for educational use of Palapa. However, another UNESCO consultant, Lester Goodman, wrote a damaging report that was critical of the Indonesian leadership, including Yusufhadi.

In 1972, Yusufhadi went to India with UNESCO support to explore the use of the ATS-6 satellite in tht country. He also met Indonesians sponsored by the US National Aeronautics and Space Administration (NASA) and the UN's International Telecommunications Union; none of them knew that the others were coming.The United States government began to be interested in educational applications of Palapa shortly before it was launched. Yusufhadi was invited to participate in the Denver conference on the assessment of the FRMS (Federation of Rocky Mountain States) and Appalachian Satellite experimental projects in 1974. In the same year, an International seminar on the use of satellites in education was held in Indonesia and was sponsored by UNESCO and USAID. Cliff Block, from the AID Washington Office of Science and Technology, attended and Yusufhadi was the primary resource person having written speeches for most of the Indonesian dignitaries. Later that year, two teams sent on a fact-finding trip; Yusufhadi and Setijadi went to the United Kingdom (where the Open University had made a significant impact); to the Ivory Coast (where the French had invested heavily in educational television) and to Korea (where USAID had made major contributions in creating the Korean Educational Development Institute--KEDI). The other team, made up of Suono and people from the Ministry of Information and Television and Radio of Indonesia (TVRI), went to Nicaragua and El Salvador (where radio had been used for primary school instruction). Then they all met in Korea to take a closer look at KEDI which was considered to be a good model for Indonesia. Dr. Robert Morgan from Florida State University briefed them on the program that he was instrumental in establishing and developing at the Ministry of Education in Korea.

Out of these efforts, a need for trained individuals was determined to be a prime requirement. USAID provided the funds for a major project that would send 20 Indonesians to a US university for one year of graduate study leading to a Master's Degree in Educational Technology. A technical assistance component was also added to the program with equipment and material acquisitions as supporting resources. Syracuse University was awarded the contract and conducted the program from 1977 to 1979. A follow-up contract, called the Educational Communications Development Project, was carried out by the Academy for Educational Development (AED), a private consulting group in Washington, DC with help in the academic portion of the program by the University of Southern California. It was during the second contract that the project called TKPK (Educational Communication Technology) was transformed into the Center for Communication Technology (PUSTEKOM), a national support service operation within the Ministry of Education and Culture. During the entire time of these contracts and during the change of status, Yusufhadi Miarso was at the helm. He

also managed to build and equip a modern building in which all communication technologies could be produced, distributed, and used by people from all aspects of education and training. USAID funding ended in 1987.

Yusufhadi Miarso has made other contributions worth mentioning. In 1971, he was one of the founders of Project Pamong along with Parmanto from Solo who, at that time headed the Solo branch of IKIP Yogajakarta. Yusufhadi's participation in Project Pamong was an outgrowth of his activities as a Board member of INNOTECH, a Southeast Asian Ministers of Education Organization (SEAMEO) project headquartered in the Philippines. INNOTECH fostered low cost learning systems which were established in Indonesia, the Phillippines and Thailand at the time.

In February, 1989, Yusufhadi was in a reflective mood and expressed the opinion that educational technology has not been very successful in his country. "I am very much disappointed with its present status" he said "people are still not aware of what educational technology is." He felt the "golden years" occured under two Ministers of Education and Culture: Syarif Thayeb and Daoed Joesoef. Since their time in office, he feels that not much has happened. From the viewpoint of this researcher, the pessimism probably reflects a feeling of what "might have been" if all the conditions had been right. Leaders and advocates of innovations usually see their visions in ideal terms. When the results are less than ideal, there is a tendency to think that their efforts have failed or, at least, have not been accepted as widely as they had hoped. This is probably the case with Yusufhadi Miarso. His entire professional career has been devoted to the advancement of the field of educational technology. Not everyone has accepted his concept nor his ideas. There is a liklihood that this lack of acceptance is viewed as "disappointment". The remainder of this report will indicate that the situation is not as bad as Yusufhadi thinks it is and there there are many reasons to believe that the field has made some impact on education and training in the Indonesian context.

The second most frequently mentioned name of persons who have influenced educational technology development in Indonesia is Santoso Hamijoyo. He was the person who influenced Yusufhadi Miarso and eventually supported his application to come to the United States to do graduate study at Syracuse University. Santoso received his Master's degree in Audiovisual Education in 1958 from Syracuse and apparently felt that Yusufhadi could gain the background he needed at the same institution.

Apparently it was Sadarjoen Siswomartojo, innovative educator from Bandung who influenced Santoso to enter the audiovisual field. Siswomartojo gave a speech in 1953 that anticipated the influence of media in the future of Indonesian education. He was first employed in community education work and then became Dean of the ETPG in about 1954. ETPG was the predecessor of FKIP and IKIP.

Sadyun was the one who had developed a master plan for the teacher training institute at Bandung that included an Audiovisual Center--which Santoso was to direct.

Santoso studied at the Institute of Education in London (1952-1953) and stayed on to take some audiovisual courses at Wandsworth Technical College. He went to Syracuse University on a Ford Foundation/SUNY program which was handled , at least in part, by Murray Thomas--a person who was very influential at the time in curriculum development. Santoso became Secretary to the Dean (Siswomartojo) and helped to establish the Audiovisual Center in 1956-57. He returned from Syracuse in 1958 to help get the Center into full operation. Yusufhadi Miarso was his assistant. The Center was not an academic program but staff were asked to give audiovisual courses to teachers.

In 1972, the Ministry of Education and Culture phase began with the establishment of an educational research and development organization--BP3K (currently Balitbang Dikbud) which included a center for media development that Santoso headed. Yusufhadi joined him there. Kartomo was the first director of BPP before the organization was officially recognized. Santoso became the first director of BP3K during the tenure of Mashuri, Minister of Education and Culture. These were the "golden years" according to Santoso when installation of media on a large scale was being encouraged. The "golden years" continued during the administration of Sjarif Thageb. When Santoso became Director General of Primary and Secondary Education in the Ministry of Education and Culture, Setijadi became the Director of BP3K and Santoso's attention was turned to other matters than the growth and development of media and technology.

Santoso never abandoned his original field although he was not active in it for many years. He did return to the United States to earn his doctorate in Instructional Systems Technology in 1965. He continued to teach at IKIP Bandung on a part-time basis and at other universities as well. He drifted into the diffusion of innovations area and taught courses in that subject.

In 1983 Santoso became Deputy Director for Manpower in the National Family Planning Board (BKKBN) and began to be more active in his role of preparing staff of the BKKBN to become trainers both at national and local levels. He felt that professional education in the field of educational communications and technology would be the best preparation for the training that had to be planned, developed and offered country wide. During this tenure, more than a dozen staff members were sent to Syracuse University to pursue Master's degrees in Instructional Design, Development and Evaluation. He continued his university teaching and dissertation advisement as he became more active once again in his original field. In 1989, he was elected President of the newly formed Indonesian Professional Association for Educational Technology (IPIK).

The third most frequently mentioned name for influential people in the field was Setijadi. Even though his background is not as specific to educational technology as Yusufhadi or Santoso, he has always been a promoter and supporter of the field. Perhaps his present position as Rector of the Open University (Universitas Terbuka) is that of the ultimate educational technologist. The Open University operates on a systems approach. It is organized for course development and evaluation on the premises of instructional systems development. Its delivery systems utilize the full range of instructional media. The entire enterprise is managed by support systems that process the students through the prescribed steps of learning. In a word, the Open University in Indonesia is the epitome of educational technology in action. Dr. Setijadi oversees the entire operation.

Setijadi received his doctorate from Cornell University. He returned to Indonesia to serve in the Ministry of Education and Culture and eventually became the Director of BP3K--the research and development arm of the Ministry. From that position, he went to IKIP Jakarta as head of graduate studies in education (Pasca Sarjana). It was from this position he moved to his present position as Rector of the Open University. It was Setijadi who hired Yusufhadi, who was retiring from PUSTEKOM and serving as Special Assistant to the Minister of Education and Culture, to head the Inter University Center for the Improvement and Development of Instructional Activities located at the Open Univesity. It was Setijadi who guided the organization of the national professional association and served as its temporary President until it was permanently established in 1989.

The names of Yusufhadi, Santoso, and Setijadi are intertwined. They have each influenced the other. They have all contributed to the development of educational technology in Indonesia. While it is tempting to say that one person "began" the movement and that one person was the major influence on another, it is better to credit all three with significant contributions to the field and its dissemination in Indonesia. They are all still influential and their contributions have not diminished with time. There appear to be a few others who might eventually take over their leadership positions but there are no clearly designated successors nor are there individuals who have emerged as prime candidates. One wonders what will happen to the field in the next several decades without clearly emerging leaders.

External Change Agents. These individuals are of two basic types: (1) Indonesian leaders in the field of Education who provided leadership and/or made key decisions that stimulated the growth of the educational technology field; and (2) foreign experts or consultants who, through their presence and commitment to the development of educational technology in Indonesia, helped to bring about recognition and growth of the field. These people may not be change agents in the true sense but, rather, are leaders and facilitators who encouraged and provided the

necessary expertise to help the field grow. Let us consider each group separately.

It was clear in interviews with Santoso and Yusufhadi that they were influenced by Sadarjoen Siswomartojo from IKIP Bandung in the early 1950s. When Santoso became Director of BP3K and Yusufhadi headed the communication technology project in the Ministry of Education and Culture (TKPK) they were supported by the various ministers under whom they served: Mashuri, Syarif Thayeb and Daoed Joesoef. Then there were individuals in other parts of the Ministry who held relatively high positions that were supportive of educational technoogy efforts and accepted programs that fell into their areas of responsibility. For example, Dody Tisna Amijaya, Director General of Higher Education and later, Sukadji, his successor. Benny Suprapto, Director of Secondary Education, provided support in recent years. W.P. Napitupulu, Director General for Non-Formal Education was one of the first to embrace the development and use of media in systematic instructional packages. There are probably others but these names seem to dominate when the question of external support is discussed.

The second group of external change agents comes from the individuals who have spent some time in Indonesia and have exerted some influence on the growth and development of the field over the years. There are, of course, a host of foreign government officials who, as part of their assignments, became deeply involved in educational technology. Their influence, through the financial support they represent, is one type of contribution. These names do not appear here because almost anyone in the same positions at the same time would have performed in just about the same way. Their contribution is one of good management of the funds they were charged to manage. It is the individuals who came to Indonesia of their own accord, because they saw a unique opportunity to influence the development of educational technology, that are the focus of this section.

The question asked of more than 40 Indonesian educational technologists was: "Would you please name one (or more) foreign nationals who have had strong influence on the educational technology movement in Indonesia." All but two persons mentioned the name of the author of this report. (This is a humbling fact and one that is mentioned with some temerity. It is an honor received with deep appreciation.) Other names mentioned more than twice were Mike Molenda, Phil Doughty, Mike Calvano, Reese Parker, John Middleton, David Merrill, and John Tyo. Single mentions included: Dick Clark, Jerry Kemp, Robert Heinich, David Giltrow, Kirkland, John Keller, Murray Thomas and Jim Papay. One Dutch person's name was mentioned, Jan Bogaart, and two others were indicated by institutional identity, i.e., TELEAC people and Netherlands people.

In reviewing the results of this "popularity contest," there are several clear conclusions. First, the greatest influence came from the United States. All the names, except the Dutch references, come from the U.S. There is a dominant cluster

of names related to Syracuse University and the first USAID-sponsored educational communications development project: Ely, Doughty, Parker, Tyo and Keller. There is another cluster related to the Academy for Educational Development project which included a subcontract with the University of Southern California: Molenda, Calvano, Middleton, Merrill, Clark and Papay. The unattached names reflect different kinds of influence, e.g., Kemp and Heinich probably exerted influence through their writings; Kirkland from the United Kingdom helped in undefined ways; and Thomas was one of the original proponents of the field as it was introduced in the early 1950s.

Most of the names come from the period of the mid-1970s until the mid-1980s. Most of the nominations come from educational technologists who entered the field at the same time. Therefore, the nomination of Murray Thomas could only have been recalled by individuals who were active when he was in Indonesia during the early 1950s. There were others who were active, and potentially influential, during the late 1960s and early 1970s, primarily from UNESCO. They were not mentioned as "influential" but were noted in some of the conversations. It may be that the UNESCO consultants did not stay in the country long enough to establish themselves as influential. The very first study was a system analysis of planning for the use of media in Indonesia. Written by Jack Heckelman, it was detailed and elaborate, according to Cliff Block of USAID's Bureau of Science and Technology. Marshall Jamison made one of the first studies regarding satellite development. The names that emerged in that context were: Emerson, who wrote a report recommending the use of educational radio, Willing (activities unknown), Gordon Law, who actually lived in Indonesia for about a year and helped to prepare the 1976 USAID-supported project, Al Horley, who helped make the transition from UNESCO to USAID, Alan Hancock, who worked with Indonesia on planning and developing communication policy from his UNESCO office in Bangkok and others of lesser note. It is likely that these names were not raised by those who were interviewed because they simply did not know about the activities at that time or they consider these people to be of lesser influence.

There was a time in the early 1970s when USAID took over many of the activities that had been handled by UNESCO. With the prospect of the Palapa satellite and its eventual launching, the US Government had a keen interest in its use for educational purposes. This eagerness to help with educational broadcasting followed the UNESCO recommendations for using broadcasting with radio first and later, television. Cliff Block of USAID became involved in 1974 when he met Yusufhadi at a conference in Washington, DC to discuss the potential applications of satellite technology to education. This was followed by a UNESCO-sponsored conference later that same year in Jakarta which was attended by Block. In 1976, Block's Communication Support Bureau in USAID commissioned Roy Colle of Cornell University and Robert Morgan of Florida State University to study the feasibility of establishing a Southeast Asia Regional Educational Technology Center.

Later, when the regional center concept was not approved, Morgan returned to Indonesia to develop recommendations for a national center for educational technology research and development with a commercial level production facility. The Korean Educational Development Institute (KEDI) which Morgan helped to create and develop was to serve as the model for Indonesia.

The influence of these external change agents is obvious if one reviews the events and reports of the decades of the 1960s and 1970s but they are virtually unknown by the dozens of people who have entered the field since that time. They are recorded here as a matter of record and, perhaps, to give some little recognition to many of the people whose work provided the groundwork for the present level of development within the country.

There are definable networks through which educational technology information flows.

A network in this report is defined as "...a number of individuals who persistently interact with one another in accordance with established patterns." (Rogers and Rogers, p. 109) One network was used as a primary data-gathering source for this study. The twenty individuals who studied at Syracuse University during 1977-1978 and finished Master's programs in the field of educational technology could constitute a network. One of the first tasks was to determine the extent to which this definition is true. One of the questions asked was, "Who are the people with whom you communicate in the field of educational technology?" After Yusufhadi Miarso, who was mentioned by almost everyone, the names that were mentioned most frequently were those from the Syracuse group. This response might be expected but, after more than ten years, with individuals spread out across the country and located in many different organizations, there might have been more dispersion of contacts. Individuals interviewed who were not part of the Syracuse group also tended to mention Yusufhadi and some members of the Syracuse group. It is apparent that some members of the Syracuse group have become core members of one network, fondly called by some the Syracuse "mafia". Certain names appear more frequently than others, like Yusufhadi; others seem to cluster around common work locales; still others share common job types like university professors. Some names not affiliated with the Syracuse group are also found; they tend to be related to like-jobs and common locations. The common locations most frequently mentioned were PUSTEKOM, BKKBN (National Family Planning Board), IKIP Jakarta, Universitas Terbuka (Open University) and LPPI (National Banking Training Institute). There are a few names that appear with some regularity who are isolates (in the sociological sense of the term) and are not affiliated with any of the locations mentioned above: Abdul Gafur from IKIP Yogajakarta, Karnean at IKIP Bandung, Iskandar Wiryokusumo from IKIP Surabaya and Wayan Ardana from IKIP Malang. There are other single mentions that are related to job tasks.

Communication among individuals in these networks occurs primarily by telephone and personal face-to-face contact. Many of these individuals attend the same meetings, usually in Jakarta. People who are outside Jakarta tend not to be as active as people who live and work there. This is a natural phenomonan that needs no further explanation. There is little written communication such as letters and journals. There appears to be general knowledge about what others are doing but most of this is passed along by word of mouth. A growing number of original books and translations are appearing from the work of individuals in the Syracuse network.

The Syracuse "mafia" includes not only the 20 individuals (now 19, since one has died) who were at Syracuse for one year, but it includes about 30 others who have degrees from the same university. Santoso and Yusufhadi are certainly included as are about a dozen others who have studied at other times. There is a growing cluster in BKKBN (National Family Planning Board) where about a dozen people have received Master's degrees from Syracuse in educational technology and adult education. All but two of these people have returned to Indonesia and have assumed or resumed positions in the field of educational techonolgy. The network seems strong and cohesive. It is not exclusive in the sense that others are kept out or that people who are "in" get priviledged treatment; it is a group of people who depend on each other for information and for support.

There may be other networks and some of the people studied here may be members of them. The networks discovered in this study are some of the strongest and most active in the field of educational technology. They will grow as others return with Syracuse degrees. It is unlikely that new networks like the Syracuse "mafia" will emerge. The University of California at Berkely has the corner on economists; the University of Kentucky on agriculturalists; and Cornell University on political and social scientists.

CHRONOLOGY OF IMPORTANT DATES AND EVENTS IN INDONESIAN EDUCATIONAL TECHNOLOGY DEVELOPMENT

1958 Santoso Hamijoyo receives MS (Ed) in Audiovisual Education from Syracuse University
1963 Yusufhadi Miarso receives M.S. (Ed.) in Instructional Communications from Syracuse University
1968 Emerson, consultant from UNESCO, recommends radio as an instructional medium; first Pelita was launched with educational radio use specified
1969 TKPK initiated as a "project"; Ford Foundation sends Chris Koch from ABC to work on radio development; Pelita I recommends the use of mass media in education, especially radio for upgrading primary school teachers
1970 UNESCO involvement begins with the Willings Commission; Yusufhadi

appointed Director of TKPK
1971 Project Pamong launched; BBC consultants arrive (Berlow, Welsh, Smee)
1972 Education Research and Development organization (BP3K) established in Ministry of Education and Culture
1974 Pelita II recognizes the use of instructional systems, the strengthening of Project Pamong, and the use of the satellite for instructional purposes Conferences on satellites in education held in Denver (Cliff Block and Yusufhadi Miarso attended) and in Jakarta; UNESCO sponsors conference in India on satellites in education--Yusufhadi attended
1975 Palapa satellite launched; planning mission led by Roy Colle comes to write proposal for regional educational technology center; radio training for primary school teachers begins in 11 provinces
1976 Syracuse University/TKPK USAID-sponsored project begins; Gordon Law makes Final Report to UNESCO; communication seminar held at Stanford; AID holds international satellite demonstration; graduate program in educational technology begins at IKIP Jakarta
1977 20 Indonesian students leave for Master's degree program at Syracuse University; Robert Morgan recommends national center for educational technology R&D + production facility
1978 Syracuse group graduates and returns to Indonesia; TKPK is institutionalized and becomes PUSTEKOM; Open Junior High School (SMP Terbuka) initiated
1979 UNICEF-supported children's TV series begins; Pelita III continues active support for use of satellite in education; open learning system in IKIP Bandung begins using radio; SMPT (Open Junior Secondary School) project begins; Ely comes to Indonesia for first time
1980 First national workshop on educational technology held in Yogjakarta; Educational Communications Development project begins; Project Pamong begins
1981 Akta V, the program to upgrade university-level teaching begins--PUSTEKOM plays an important role
1982 Distance teaching program for junior secondary (SMP) teachers begins (D2 using self-instructional modules); planning conference for Universitas Terbuka (Open University) held in Jakarta and Yogjakarta supported by USAID and the East-West Center
1983 Curriculum and faculty development seminar; first series of educational television programs (ACI) produced by PUSTEKOM aired
1984 Universita Terbuka opens; satellite program (SISDIKSAT) with Eastern universities consortium operational; ECD project ends; Pelita IV emphasizes continuing use of media and technology to deliver educational programs
1986 Inter-University Center for the Improvement and Development of Instructional Activities established at the Open University with support from the World Bank
1987 Applied Approach (for university-level course reconstruction) sponsored by the Netherlands University Foundation for International Cooperation (NUFFIC) begins

1988 State guidelines for development decided by People's Assembly with explicit policy for educational media development and utilization; cooperation between the Indonesian and Dutch governments to provide instructional materials for learners of all ages initiated
1989 Pelita V begins with continuing support for educational media and technology; first national conference of the Professional Association of Indonesian Educational Technologists (IPIK) held in Jakarta

Most of the conditions that facilitate adoption and implementation of educational innovations were present in the case of educational technology in Indonesia.

Eight conditions that facilitate the adoption and implementation of educational innovations have been reported in other sources (Ely, 1977; Eraut, 1976; Mayhew, 1976). One aspect of this study was to determine the extent to which any of these conditions were present or not present as the products and processes of educational technology that were introduced into Indonesian society and culture. The conclusions that follow are based on conversations with educational leaders both from educational technology and other aspects of education and observations made during visits over the past ten years. Some literature, such as project reports, the five Pelitas, and journal articles was used. Each element will be considered separately.

Dissatisfaction with the status quo. There are numerous expressions of dissatisfaction with education in Indonesia at all levels. It is obvious in each pelita (5 year plan) and in the attempts to correct inequities and to improve the quality of teaching and learning. Like most developing countries, the problems center around the number of young people who want an education when there are insufficient numbers of classrooms and teachers. Where teachers do exist, they are found to be wanting in professional education, either in the substance of the field in which they teach or in the teaching methods they use. Many of them barely meet minimum standards for teaching, which often means a secondary school education. While these shortcomings are well-known and documented, the ability to provide more space, more teachers, and more training is a financial impossibility. Very often governments know what they ought to do but for a variety of reasons they do not do it.

Indonesia has made attempts to correct some of the problems and has made use of educational technology principles in doing so. The adoption and implementation of low cost learning systems, as in Project Pamong, indicates an attempt to correct some of the inequities. Experimentation with the Open Junior Secondary School (SMP Terbuka) in areas where children could not go to school because there were insufficient number of classrooms and teachers, is yet another attempt to use educational technology concepts to solve real problems. In 1989, the United Nations Development Program provided assistance to expand the SMP

Terbuka program. The Open University (Universitas Terbuka) is, in its fifth year, the largest university in the country. It filled the need for opportunity to go on to tertiary education for over a quarter million secondary school graduates each year who could not obtain a place in one of the 48 public universities and could not afford any of the private universities. None of these programs would have been started, nor would they be continued, if there was not some "dissatisfaction with the status quo."

Educational technology has been brought to bear on the quality problem. For more than 15 years primary school teachers have been upgraded and updated through instructional radio and correspondence materials designed to be used at a distance. Programs for university lecturers have been initiated to help improve the quality of teaching and learning at the tertiary level. First, the Akta V program begun in 1981, required all junior lecturers to attend courses in pedagogy. An improved version was begun about 1985 and a mutation of the new Akta V was the Applied Approach, introduced in 1986 as an attempt to help lecturers to reconstruct their courses using a few basic principles of instructional design and development. It is now being used in 16 universities and teams exist at these institutions to help colleagues follow the steps recommended for teaching improvement. These programs are clearly in response to dissatisfaction with the quality of teaching in higher education institutions.

As impressive as these programs may sound, they are almost insignificant in terms of the many teachers, learners and classrooms in this geographically and ethnically diverse land. Yet they <u>are</u> there and they continue. They expand and contract but endure. There are responses to the dissatisfaction and thus fulfil the condition that there must be a "dissatisfaction with the status quo" if change is to occur.

<u>Knowledge and Skills</u>. If innovations are to be adopted and implemented, the individuals who are expected to perform in new or different ways must have the knowledge and skills to act in new or different ways. This condition is simple logic but must be stated so that it is recognized as a necessary element of implementation. Most innovations, especially involving educational technology, require new knowledge or skills once the decision to adopt the innovation has been made. Most decisions regarding innovations are made by policy makers or educational leaders, but actual implementation is most often made by teachers. Therefore, one aspect of any adoption must be the inclusion of education and/or training to assist the teacher in actual use of the new product or procedure. Such training is in itself an innovation and is subject to the same resistance that confronts the major change that the training is supposed to bring about.

It is difficult to spell out specific knowledge and skills that might be needed by individuals who might be involved in implementation. Most of the innovative

activities that involve the products and processes of educational technology require some new knowledge and skills. Without such background, it can hardly be expected that individuals would be able to introduce and carry out new activities.

Rewards and Incentives. Rewards vary according to individual value systems. What is rewarding for one person offers no incentive for another. However, it is unlikely that innovative ideas related to educational technology would be adopted and implemented if there were no rewards. For some people it is enough to be identified with something new; they want to be on the "cutting edge" of new ideas. Educational technology in Indonesia is such an innovation. Some people have supported its introduction and have embraced its principles because they belived that a new way is a better way. There are others who see expanded opportunities with educational technology competencies. They are more likely to be hired as consultants to education and training programs in other sectors and thus increase their earning potential--an important goal for educators who tend to be on the lower end of the professional salary scale. Adoption and implementation of educational technology means recognition by others in the field of education and training. Successful individuals are sought out by those who need help in the design and development of training. For some people, such recognition is important. It appears that all of these factors are present in Indonesia. In talking with various people regarding their role in the field of educational technology, it becomes clear that the profession is chosen primarily because of the perceived rewards that come from being in a new and growing field. For most Indonesians it is not the monetary reward that is sought but rather the feeling that they are part of a movement that has the potential to bring about significant changes in the educational system of the country. There are exceptions, of course, but they are recognized much less.

There has been much talk of late regarding "intrinsic rewards" for university lecturers who follow the Applied Approach in restructuring courses according to one instructional development model. Perhaps the term is used because there is insufficient money to provide "extrinsic rewards." But there may be a side to the Indonesian university lecturer which accepts "intrinsic rewards" as sufficient incentives to go through the course redevelopment process. It appears to be working; the Applied Approach has been accepted in 16 universities and teams in each university have continued to train others to use the process. The only visible reward is time to attend a workshop to gain some of the basic knowledge and skills and a colleague-tutor to work individually with the lecturer during the initial stages of course redevelopment. At an earlier time, credit toward promotion was given and participation was required for continued appointment at the university. When these requirements were lifted, most lecturers wanted to participate in the process and the Council of Rectors indicated their desire to continue sponsoring the local consultant teams even though support from the Director General for Higher Education was being withdrawn. Apparently, the "intrinsic reward" concept has taken hold in the case of this innovation.

Time. One condition that is often forgotten when considering the factors that appear to facilitate or hinder change is time. Once a new idea has been presented and has been adopted, it seems to be easy to move immediately to implementation. However, even after training is completed, the individual or group that is ultimately responsible for implementation has to prepare for it. This often means the creation of new materials, opportunities to test them, practice sessions, and work with colleagues or trainers who can assist. Simply buying a piece of equipment and/or new instructional materials is insufficient for implementation. After training, plans for its use must be made. This means integration with the existing procedures or creation of new procedures. It means using the systems concept of educational technology to plan, deliver, and evaluate. The time factor is often not considered or thought to be something that is easily "found" by teachers and other busy educators.

In the case of educational technology in Indonesia, there have been instances when time was considered and when it was not. After the launching of the Palapa satellite, there was a lot of pressure to use it to demonstrate its utility in educational settings. There was money offered as an incentive to begin such a program as soon as possible. Educational technology leaders hesitated to move so fast. They argued that programs were not yet available and needed to be produced. They pointed out that teachers were not yet ready to receive and use the programs; that such preparation required time and effort. Consequently, the use of the satellite was postponed for several years. In fact, it was never used for primary and secondary education, only higher education. The wisdom of not moving rapidly into operation may have prevented a serious failure due to the lack of adequate preparation. It was probably better to have not gone ahead.

A second instance illustrates the risk of moving too fast without allowing for sufficient time to prepare. The process of planning for the Open University (Universitas Terbuka) began in 1980. Detailed planning was underway in 1982. The date for opening was set for September, 1985 when, all of a sudden, a decision was made at a higher level to open in September, 1984--one year earlier than was planned! The lead time required to open any new institution is several years and an open university is no exception. Without the year that was originally part of the planning process, many shortcuts had to be taken and consequently, many parts of the UT operation were not ready for full-scale operation when the opening occurred. Course development had to be rushed and consequently no field testing was possible. Computers had to be programmed for administrative purposes but there was insufficient time for "debugging" and consequently there were mix-ups that led to widescale dissatisfaction among the new enrollees. There were not enough trained personnel to handle all aspects of the program and consequently decisions were made on an ad hoc basis as they were needed. Time is indeed an important condition that often determines the success or failure of an innovative

program. It seems to be especially important for innovative programs where all variables are new and must be under control prior to initial implementation.

Resources. Resources are those materials and equipment that are necessary to make any innovation work. People resources and time resources are not included in this definition. They are incorporated into other conditions mentioned in this section. Equipment (sometime called "hardware")could mean sophisticated delivery systems like broadcasting transmitters, computer systems, or interactive video. In the cases investigated here, it is more likely to mean television monitors, microcomputers, and audio cassette players. The "big" media often provide the infrastructure for large scale innovative programs such as the Indonesian Eastern Universities Satellite Consortium (SISDIKSAT) that permits origination of programs from central Java and receivers in Eastern Island Universities. The "little" media are more common and are more likely to be used at the local school and university levels. The "little" media are more pervasive, such as overhead projectors, slide projectors, and audio cassette players but are more difficult to associate with innovative programs.

Materials (sometimes called media or software) complement the equipment. Slide projectors are not very useful without slides; overhead projectors do not communicate anything without transparencies; and audio cassette players without the audio cassettes are merely "hardware." But material resources go beyond the audiovisual media; they include books and publications of all types, flat pictures or drawings, real objects and models, and maps and graphic representations. There is yet another type of resource that can best be called "techniques." These resources are classroom procedures that rely more upon the action of the teachers and the response of the learners than on the use of equipment and materials. For group instruction, examples would be simulations and games, dramatizations, presentations, debates and discussions. For individuals, examples would be programmed instruction, peer tutoring, and listening.

Another manifestiation of resources is the Learning Resource Center (LRC) that appears at many institutions. For example, many of the IKIPs (teacher education institutions) have LRCs. Some of the regional education centers (kanwil) have such centers and in the main office of many national organizations there are resource centers that are sometimes called libraries. In PUSTEKOM, the library contains both print and audiovisual media; in LPPI the same can be observed. LIkewise, BKKBN and BALITBANG DIKBUD have resource centers that are called libraries and have comprehensive collections of materials.

Innovative activities that involve the products and processes of educational technology require resources whether they are simple or complex. These resources are usually used for one of two purposes: (1) to enrich the teaching and learning by

providing concrete examples for learners to see, hear, and touch; and (2) to be surrogate teachers by presenting information that might normally be communicated by a person. In the first case (enrichment) the resources are supplemental to the instruction organized and delivered by the teacher. For example, the teacher uses a map to point out the location of an African country or uses a film or videotape recording to show a chemical reaction. In the second case (surrogate) the resource replaces the teacher and becomes the prime information source. In other words, if the learner did not use the resource, s/he would not gain the information. For example, programmed instruction is used to teach the concept of pi in mathematics or an audio cassette is used for introducing new words and phrases in learning spoken English.

Sophisticated resources are often produced by large national organizations and then made available to local users. For example, film or video presentations that require expensive equipment are made by organizations that produce such materials. When they are completed, and field tested, copies are then made and distributed to regional centers which, in turn, send them to local users. There are resources that are simpler and less expensive and they are produced locally, usually by educators in regional offices or locally by teachers themselves. If local teachers produce the materials, they usually need help in developing the skills to create such materials and they need raw materials. In some cases, creative local teachers use resources available in the local setting; for example, stones for counting, flowers for science, and village elders for local history.

Indonesia, like many developing countries, has limited educational resources. National agencies that could produce resources do not systematically create such materials. PUSTEKOM has produced some film, filmstrip and slide materials for use in primary and secondary classrooms. TVRI has not produced any radio or television programs specifically for instructional purposes, unless the occasional Open University programs could be considered as instructional. They are for limited audiences. Non-formal education agencies like Community Development with its various packets of resources for field workers and BKKBN with resources for its field representatives seem to be more active and systematic in the development, production and distribution of resources than the formal education agencies. Libraries as resource centers in schools are not common. Even in the universities, the libraries are limited in scope and quantity of collections. The lack of systematic development of resources means that educational technology can be found only in limited locations. There is no comprehensive plan for the creation and distribution of resources in Indonesia and this fact would seem to reduce the possibility of further growth and expansion of the field.

There may be one exception. In the Open University (Universitas Terbuka) the use of resources is absolutely essential. Without resources there could be no university since there are no lecturers. The resources are surrogates for the

lecturers. Resources are mostly in print and there are audio cassettes and pictures, charts, and graphs. The creation of some very good materials, and their general availability in bookstores, has caused some traditional universities to use them thus confirming their value. The demand and use of these resources also points up the need for quality instructional resources. To a lesser extent, the use of self-instructional modules by the Open Junior Secondary School (SMP Terbuka) also support the contention that resources can be surrogates for teachers and can present essential information in creative ways for independent learning.

Leadership. In the interviews, the individuals were asked to name leaders in the educational technology movement in Indonesia. The names, as noted above, were Yusufhadi Miarso, Santoso Hamijoyo, and Setijadi. When these designated leaders were interviewed they named persons who were leaders in their eyes. They were not educational technologists, but persons in high positions who were advocates for the movement and actively facilitated its diffusion. In the case of Yusufhadi, it was Syarif Thayeb and Daoed Joesoef, Ministers of Education and Culture during the early days of his directorship of TKPK and PUSTEKOM. For Santoso, it was Prof. Sadarjoen Siswomartojo, Dean of Education at IKIP Bandung. For Setijadi, the picture is not clear but there were strong interactions with Santoso. Likewise, Santoso had a strong influence on Yusufhadi and Yusufhadi has had major impact on dozens of more contemporary educational technologists. Two types of leadership are clearly evident: (1) leadership within the movement itself and (2) leadership outside the movement by persons not directly involved in it. The second type of leadership might be more appropriately called political support. The movement in Indonesia had both types of leaders and and they were clearly responsible for the advancement of the field in that country. In fact, the three major figures are still active and continue to exert strong influence on the growth and direction of the field.

In analyzing responses to the question regarding "reasons ...that have helped educational technology to be accepted in places where it is successful..." the most frequent response was "leadership". Responses were consistent: "strong leadership," "strong political support," "support from bureacracy" and "open-minded decision-makers". Leaders from both levels are necessary to facilitate innovative activities such as those in the field of educational technology.

Commitment. This condition is closely related to leadership. Commitment is first held by the leadership. Commitment without leadership is empty and leadership without commitment lacks direction. Commitment cannot be observed unless there is some visible action. One would have to assume that the actions of the individuals who were named leaders in the educational technology movement stemmed from commitment and that the support received from "above" was an indication of commitment.

There is a firmness about commitment. It infers a solid position or stand on an issue or activity that cannot be easily shaken. Care must be taken not to mistake such a position for stubbornness. Commitment is that visible support for an idea or action that facilitates its acceptance by others.

With this concept in mind, one would have to conclude that both the educational technology leaders and their superiors named above possessed a commitment to the adoption and implementation of educational technology. Without this commitment, educational technology could not have grown and prospered in Indonesia. It was responsible for the initial acceptance and continued use of the products and processes of educational technology.

There is another dimension beyond the commitment of leaders. It is the commitment of operating personnel in the field. In the case of education, it would be the supervisiors, principals, and teachers; in the case of universities, it would be the deans, department chairs, and the lecturers who must eventually demonstrate some type of commitment to any innovation in the process of teaching. After all, acceptance of educational technology requires some change in the status quo. Such changes are often threats to professionals who have been doing things the same way for many years. Therefore, one of the major tasks of the change agents, both leaders and people in the field, is to bring about a commitment on the part of those who will finally implement the innovation. If the professionals who teach every day are not committed to the new procedures, it is unlikely that they will be implemented or will be implemented in ways that are unlike the desired approach. This is clearly a change in attitude--the most difficult learning to accomplish. The only real measure of commitment by people on the line is to observe changes of behaviors; to see new procedures in operation and to hear teachers, lecturers, and other educators express their unqualified support of the new procedures.

Such evidence is difficult to find. It is found in the Open Junior High School (SMP Terbuka) settings where students are actively participating in an alternative school environment. It is found in the Project Pamong schools but to a lesser extent. The original Project Pamong procedures were based on models of the low cost learning system developed by Prof. James Elson of Indiana University. Follow-up studies of Project Pamong have found that it continues but many adaptations have been made according to local needs and teacher preferences. Is it still Project Pamong or is it a new program? The Pamong principles have been translated into university-level programs at the Universitas Seblas Maret in Solo. Is this a commitment to the Pamong principles or is it an entirely new innovation?

Once again, a new institution, the Open University (UT) reflects the type of commitment being discussed here. Since the Open University exemplifies educational technology, anyone associated with it must necessarily be committed to the principles and practices of the field. There appears to be no alternative than to

be fully committed unless a person is part-time and owes allegiance to other institutions and rejects the basic tenants of educational technology even while working within the context. This would be a rare occurrence.

In sum, commitment can be seen in leaders of the educational technology movement and in certain individuals who encouraged and supported them. It can be seen at the operational level in individuals who have adopted and implemented new procedures or techniques that use the principles and practices of educational technology. Without commitment at all three levels, the quality and effect of this innovation is probably diminished.

Participation. This condition is another one that seems to have face validity. The more active a person is in the discussion, adoption, diffusion, implementation, and institutionalization of an innovation, the more likely the innovation is to succeed. So it is with educational technology. The most difficult introduction to this field and its products and practices is to have them imposed from "above". When teachers or lecturers are told to use educational technology and have no part in the decision, they are likely to reject it. The converse is the ideal way to bring about adoption and implementation. Involve everyone who is likely to be a future user of educational technology to participate in the discussions about its use. The more individuals participate, the more likely they are to adopt, support, advocate, and help others to do so. It seems so obvious yet there are many cases when individuals are told what to do and how to do it without any warning or participation in the decision. It is no wonder that some innovations are rejected out of hand.

There are two facets of the Indonesian personality that are involved here. One has to do with the acceptance of authority decisions. Many Indonesian people feel that they must follow the wishes of those who support them. So if a principal or Ministry of Education official says that a new procedure or material must be used, it will be used. Educators will try to adopt (most likely adapt) the new procedure in their current work without questionning its purpose, value, or application. There is another characteristic that seems to be at odds with the first characteristic: the proclivity for Indonesians to come to group consensus. In many aspects of life in this country, individuals will not make a decision but they will meet in a group to discuss an issue or a new procedure and after considerable deliberation, they will come to a consensus about the issue or procedure. With a strong central Ministry of Education and Culture and a national curriculum, it is understandable that there is acceptance of the authority. Yet there must be a modicum of resistance that causes some hesitation on the part of the professional who must blindly accept the latest innovation without having one word to say about the decision.

There is a body of literature that supports the hypothesis that greater participation in the decision-making process will yield greater acceptance of a new product or procedure. There is nothing to change that principle in the Indonesian education

environment. However, most of the innovative practices that now exist in the area of educational technology were not participatory in nature. They were imposed from "above" with the expectation that they would be adopted by grateful professionals who would view them as "modern" attempts to bring the country into the technological age. Some "early adopters" have embraced the new technologies and have become strong advocates and leaders, but the evidence is that most innovations have been fairly limited in their acceptance and use.

There has been one example of participation that seems to illustrate the value of this condition: the Applied Approach course reconstruction program sponsored by the Dutch government. This rather simple and static procedure for low level instructional development is intended for individual university lecturers. It is designed to help them be better teachers and for the students to be better learners. The innovation is a process for course reconstruction following basic principles of learning psychology. It has had the endorsement of the Director General for Academic Affairs in Higher Education and has been operated by a small team of Dutch and Indonesian educators since 1987. The central team has gone into 16 universities and has conducted a one week training program for teams from each institution. Those teams have become the "core" teams at each university and have conducted similar workshops and serve as tutors for the individual lecturers. The participation in the workshops and in the course reconstruction activity is optional. The program has been successful and more teams are being trained at more universities. At the individual universities, more lecturers are participating in the program. Support from the Ministry of Education and Culture has ceased and the rectors of the universities have indicated that they will continue to support the program out of their own budgets, which is a major commitment. The participation of individuals has been central in the the acceptance of this educational technology innovation. It seems to be well on its ways to broader adoption and implementation.

Closing Comments

Indonesia continues to grow in its use of educational technology products and practices. Just as in more developed nations, the business, industry and governmental sectors are leading the way with education trailing behind. Even though educational technology entered Indonesia through Education, its status and impact is still marginal in that sector. It is more likely now to observe educational technology as an integral part of other programs in Education, e.g., the Open University, the Open Junior High School, and the efforts to improve the quality of university teaching. Many of these programs would not have reached the current level of acceptance and sophistication without the earlier projects that paved the way.

With the establishment of a national professional organization, the publication of books within the scope of the field in the Indonesian language, and the continuation of academic programs to prepare professional educational technologists, the indicators are that educational technology has been recognized as a profession and that many of the dreams of those individuals who had a vision for the field have been realized.

CHILE

Introduction

Chile is a technological society. With almost 80% of its population in urban areas, and a strong national will to be among the most productive nations of the world, technology is a "must". The infrastructure for transportation, public utilities, and communication is well-established and evidence of technological adoption is everywhere, except in many areas of education.

The purpose of this study is to determine the extent to which educational technology has been diffused and implemented in Chile over the past 25 years. These findings will be compared with Peru and Indonesia. The hypotheses regarding conditions that facilitate implementation of educational technology are the same for each country but the findings vary.

Summary of Findings

1. The is no general agreement about the definition of educational technology.
2. There are people who consider themselves to be in the field, or more likely, part of the educational technology "movement".
3. Educational technology programs do exist and have been institutionalized under a variety of labels and in many locations. The only national coordinating agencies are the Associacion Chileno para Tecnologia Educativa (ACHTE) which is not currently active, and the Centro de Perfeccionamiento, Experimentacion e Investigacion Pedagogicos in the Ministry of Education.
4. There are opinion leaders who seem to point directions for the field but it is likely that they would not nominate themselves for such a position. The are: Fidel Oteiza, Luis Eduardo Gonzalez and Adriana Vergara. There are many more who represent specific interests within the scope of educational technology but are not widely known, or perceived to be leaders by others outside the specialization. Special mention should be made of Clifton Chadwick's influence. He is a Northamerican who spent many years in Chile and worked actively in the field.
5. There are definable networks through which educational technology information flows. They are organized around special interests such as educational television, audiovisual communications, distance education and informatics.
6. There is confirmation that most of the conditions that facilitate change are present where educational technology programs are operational and growing.
7. There is considerable documentation about the field's content and intellectual growth in Chile.

Each of these conclusions is discussed more fully in the following sections.

There is no general agreement about the definition of educational technology.

In a 1983 article on "Development of Educational Technology in Chile", Kotesky and Calderon pointed out that "The very name 'educational technology' has been rejected because of the lack of precise understanding of the word technology". Educational technology (tecnologia educativa) is a term recognized by many educators and others in Chile. When the term was adopted in the late 1960s and early 1970s, the field was focused on the use of behavioral objectives, the development of programmed instruction, and the use of a systems approach in the development of instruction. To many, this was (and still is) educational technology though the field has moved beyond the rigidity of programmed instruction. There apparently was a countervailing force that actively opposed educational technology as "mechanistic," "inhumane," and "limited". At this point the early contributors to audiovisual communications, with its emphasis on improving teaching through contemporary media, were largely forgotten. There has been a transition since the wave of programmed instruction passed and that is the emergence of information technology and a resurgance of interest in curriculum development. Educational television has a firm foothold and education at a distance uses most of the models and vehicles of instructional design and development which characterize educational technology in North America. It is no wonder that concepts of the field vary and perceptions of educators retain the older definitions. No one seems to worry about it and there is no unifying force that brings together individuals with different orientations.

There are people who consider themselves to be in the field, or more likely, part of the educational technology movement. A consequence of the diversity is that there is no "field" per se. We see a movement rather than a field; common goals using different means to achieve them. There is no campaign to convince other people that there is a "better" way. The common goal seems to be effectiveness and efficiency of teaching and learning--insuring that time invested by the learner will yield an agreed upon outcome. Underlying this goal is a second and less obvious purpose: to actively engage the learner in new procedures that will help him/her to become responsible for his/her own learning. The participants in this movement, whatever medium or process they advocate, are the education reformers of the late 20th Century. They believe that there must be a better way and that innovative learning materials and strategies can lead the way. As a movement, there may be many other professionals who do not actively work in any aspect of educational technology but actively support its premises and practives; e.g., rectors and academic vice rectors, school administrators and the general public.

The people who consider themselves to be in the field have a vested interest in maintaining it. Some are the academics who teach courses in educational technology at two universities that advertise and offer a Master's program. There are those in the Ministry of Education who hold positions in educational technology

and there are those, perhaps from earlier times, that want to hang onto the label because it is officially recognized by the government, the public, and colleagues inside and outside the country.

There seems to be no trend to revive the term or to create a new name since people will continue to operate as they have been regardless of what the "field" is called. If there is any direction, it appears to be toward information technology which is focused on the use of microcomputers and telecommunications.

Educational technology programs do exist and have been institutionalized under a variety of labels and in many locations.

The best way to describe the number and variety of programs in Chile is to name the categories into which most of the centers of activity fit: audiovisual communications, instructional design, distance education, educational television, and information technology. The levels and locales in which these programs occur are primary and secondary education, tertiary and university education, vocational training, business and industry training, military training, medical education and general adult education. First, let us consider the categories of programs.

Audiovisual communications. The concept here is support of instruction with a variety of media. Some media are custom-produced and others are obtained from "outside" sources. Perhaps one of the strongest audiovisual communication efforts is in the nine medical schools in the country. The offices of medical education in each faculty of medicine create instructional materials. It is not uncommon to have a medical artist, photographer, technical personnel and classroom support services. The one medical school that is mentioned more often than any other is at Austral University in Valdivia where there is a strong leader in medical education through media. The faculty of education at the Catholic University in Concepcion will have an audiovisual laboratory, courtesy of the Canadian government, to be used in training teachers to use media in classrooms. Language laboratories, one manifestation of the audiovisual movement of the 1960s seem to be alive and well in language teaching departments. The Metropolitan University of Santiago has several language laboratories and technical support services for preparing, dubbing and re-recording tapes. Overhead projectors and slide projectors appear upon request and one feels that basic equipment could be found in most univeristy and commercial settings. One private school for teaching English advertises the use of "AV aids" as part of its instructional system. Audiovisual communication support is built into many of the instructional packages used for distance education and systematic instructional design.

Instructional design. The theory of instructional design is taught in at least two Master's programs at the Pontifical Catholic University in Santiago and the Catholic University in Valparaiso. Its practical application is found in settings where

distance education materials are prepared. In business and industrial training. INACAP (Instituto de Capacitacion Profesional) is one of the largest, oldest, and best known programs for using instructional design principles in the creation of technical and vocational training programs for young people and workers on-the-job--much of it offered at a distance. Employee training programs such as one at Bancard employ instructional designers to create programs for in-house staff training. The term, instructional design, seems to be more widely accepted and understood than educational technology. There have been programs for in-service teacher education offered by the Centro de Perfeccionamiento at the Ministry of Education and by the University of the North, in the field of guidance. Distance education programs use instructional design principles and practices, some of which follow the technology of programmed instruction.

Educational television. The major effort in educational television is TELEDUC, a national education program offered at a distance via television, using the commercial channel of the Catholic University in Santiago. Special books and related materials are prepared for the telecourses offered on Saturday and Sunday mornings. Usually six courses are presented during any one semester and are intended for adults although younger people (ages 9-14) are allowed to enroll in computer and English courses. There are programs for primary school children presented two weekday mornings each week. TELEDUC has received considerable assistance from the government of Japan in terms of human resources and equipment. The courses are developed by teams of content specialists, television producers, educational technologists and editorial specialists.

Other television activities include: (1) the use of videotape for recording student teachers for later analysis (microteaching); (2) research on the impact of television on children and adults (and how to help persons to develop critical viewing skills) by the Media Research group at the University of Playa Ancha in Valparaiso; and (3) the production of videotapes for training.

Information technology. There is emerging a growing interest in the use of microcomputers in education. While most of the efforts appear to be at the universities, and most of it is science, mathematics and engineering, there are some programs at the primary and secondary level which focus on computer "literacy" (how to use computers) but not on teaching with computers. There has been a lot of interest in LOGO because of a TELEDUC course on the subject. About 20% of the secondary schools, mostly private, have microcomputers and are using them. A UNESCO report (1986) indicates that Chile is the only Latin American country to report a university-level course for training teachers to use computers. From 1979 to 1986 over 450 teachers completed the course.

The Department of Mathematics and Computational Science at the University of Santiago is conducting research in the area of mathematics education using

principles of artifical intelligence. Extensive use is made of PROLOG.

There seems to be considerable interest in information technology because of activities in other sectors. ENTEL, the national telephone service, has a video conference center in Santiago. BITNET is now being used at several universities because NASA made some satellite space available. Software is being developed in Chile and exported for use in other countries. Most of the emphasis is on business and industrial applications in Latin America and the United States. Imports of personal computers to Chile increased from about 5,000 in 1987 to about 30,000 in 1988. Conferences are held regularly on computer applications in management and library information systems are in operation; RENIB (National Network of Bibliographic Information) connects ten libraries by a computer network that offers an online union catalog of all the holdings of each library.

It is clear that Chile has opted for information technology as a major tool and software as an export product.

There are opinion leaders who seem to point directions for the field.

Opinion leaders do not announce themselves. Their names emerge in conversations and in the literature of the field. They are the individuals who are listened to when they speak. Their words are usually worth a little more because over time they have earned the right to speak and have been effective in doing so. They are sometimes elected to office and often asked to speak and/or participate in conferences. There is another kind of opinion leader who earns the title because of the position that person holds., e.g., dean, rector, or ministry official. When they speak, others listen because it is understood that people in such positions ultimately make decisions that may affect the field.

In Chile, each person was given a list of potential opinion leader's names that had been collected from (1) a Northamerican who had been active in educational technology in Chile (Dr. Clifton Chadwick); (2) published literature by Chileans (especially in the Revista de Tecnologia Educativa; (3) the names attached to the centers of activity listed in the International Yearbook of Educational and Instructional Technology (1988); and (4) personal acquaintances with whom the researcher had maintained contact over 25 years. New names, discovered during the interviews, were not added to the original list of 26 names. During the process, 12 additional names were nominated.

The list was given to each of the 17 people interviewed (whose names all appeared on the list) and each one was asked to indicate the names of individuals that they knew or did not know. (No definition of "know" was given.) Of the 17 interviews, 4 people were known by 13 individuals; 9 were known by 12 people; 2 by 11; and 4 by 10. Thus, 19 people related in some way to the field of educational technology were

known by 10 or more "prominent" individuals whose names were also on the list. Only 7 were known by 8 or fewer individuals.

There are several explanations for the outcome. Some of the frequently recognized names were rectors or vice rectors of Chilean universities (current and past) who had in some way endorsed the concept of educational technology. They were thought to be sufficiently involved with educational technology to be designated opinion leaders. They are (or were) part of the movement but not actually in the field of educational technology. Therefore, they could not be called leaders of the field, or even the movement. The strategy then became one of eliminating the seven names of people who were not directly involved in the field. What remained was a list of educational technology people whose names were known by many. These individuals were all interviewed to determine the extent of their leadership role. Three people were determined to be most influential and another set of names were influential, but not as strong as the first group. The names of the first group are:

Luis Eduardo Gonzalez, a researcher and author from the Programa Interdisciplinario de Investigaciones en Educacion (PIIE);
Fidel Oteiza, a professor of mathematics and computer science at the University of Santiago; consultant on information and education for the UNESCO Regional Office for Latin America and the Caribbean, and President of ACHTE; and
Adriana Vergara, in charge of educational technology for the Ministry of Education; a lecturer in Instructional Design at the Catholic University in Santiago; and new editor of the Revista de Technologia Educativa.

The second group represents an even broader specturm of organizations.

Alfonso Gomez, Executive Director of TELEDUC;
Mariana Martelli, Rector of the University of Playa Ancha;
Sergio Elliot, instructional designer for distance education programs at the Chilean Institute for Humanistic Studies;
Maria Irigoin, instructional designer for INACAP (National Institute for Professional Training); and
Mario Leyton, former head of the educational technology program at the Ministry of Education; now working for the UN in Guatamala.

Observations by the researcher seem to indicate that there is an active network among Gonzalez, Oteiza, Elliot, Irigoin and perhaps Vergara and Martelli. The others do not appear to be in the same network. They are likely to be in other networks closer to their specialities.

Special mention should be made about the influence of Clifton Chadwick, who was associated with the Organization of American States (OAS) Multinational Project in

Educational Technology from 1971 to 1983 and continued to serve as Editor of the Revista de Tecnologia Educativa through 1986 from Chile. He has been given credit by nearly every person interviewed for moving the field ahead in Chile. He was the Editor of the Revista from 1977 to 1986 and published several reviews of the status of educational technology in Latin America. With Alicia Rojas, he wrote a Glossary of Educational Technology, the first of its kind in Spanish. It was translated into Portugese. Chadwick left the OAS project in 1983 and Chile in 1987 and now resides in Honduras.

The name of Roberto Char, from the University of the North in Antofagasta was often mentioned by professionals in the field but the researcher was unable to reach him. He seems to have made a major contribution to the field and its development in Chile.

Some of the leaders stand out for significant contributions in one area but do not seem to communicate with other professionals in related areas of interest. Alfonso Gomez, for example, is committed to TELEDUC to the point where he is devoting all his professional energy on that single project. There is no educational television movement in Chile other than TELEDUC so there are not many colleagues with whom to communicate. Maria Irigoin has been involved with INACAP for many years and represents the interests of technical and vocational training.

Miguel Reyes Torres should be singled out for his leadership in media education--a type of "literacy" that calls for critical viewing (and listening and reading) of mass media. His Center for Educational Media Research at the University of Playa Ancha in Valparaiso claims 19 theses, 20 publications (3 in international journals), and several conference papers at international meetings as output over a 5 year period (1982-1987). There do not appear to be any other professionals working in this area in Chile.

There are leaders; there are networks and these people keep the field (or, at least, the "movement") alive and well in an otherwise fragmented field.

There are networks through which educational technology information flows.

The networks seem to organize themselves in work-similar categories. In other words, people who are doing the same kind of work, regardless of locale, seem to communicate more often than level-similar categories, e.g., schools, universities, adult education, etc. Potential stimuli for formation of networks were also explored. There was some evidence that the groups of people who were sent to Florida State University in the United States by the Organization of American States since the early 1970s tend to exert some leadership. Many of these people are in key positions now but they rarely communicate even though they are cordial and know one another. A cluster seemed to form around the Multinational Project of the OAS

and another was stimulated by the International Labor Organization (ILO) in the area of vocational training. The two major academic programs regularly hire part-time lecturers to teach courses from the ranks of active full-time professionals who have backgrounds similar to the university personnel who coordinate the programs.

The information networks seem to be more personal. The visit of this researcher stimulated contacts among many people who easily identified and could be contacted by telephone. But these individuals would not regularly meet at a conference or seminar. The Asociacion Chileno de Tecnologia Educativa (ACHTE) was an attempt to create such a network and it worked for almost ten years--again probably because of the Multinational Project located in Santiago. The organization currently exists but rarely meets.

A series of meetings, sponsored by the Consortium of Rectors of Chilean Universities, offered another opportunity for networking. These rather large (200-300 attendance) and important meetings were held in Antofagasta (1976); Vina del Mar (1978); Santiago (1980) and Valparaiso (1982). They probably set up networks or at least created personal connections that have led to communication even today. The publications stemming from those meetings offer an intellectual history of the field's development in Chile. However, there has been no meeting since 1982.

<u>There is confirmation that most of the conditions that facilitate change are present where educational technology programs are operational and growing.</u>

One important dimension of this study is to determine the extent to which there have been "conditions" or "factors" that appear to have facilitated (or hindered) the implementation of educational technology in Chile. These conditions are not easily determined except by asking individuals, who have been involved in the field over many years, to reflect upon the reasons why certain innovations seemed to be accepted and others did not. In the course of interviews, the interviewer often had to name one or two specific successful educational technology projects to help answer the questions. Sometimes prompts helped to stimulate replies. The questionnaire itself, which was used as an interview guide, suggested such prompts as: "financial resources were available," "there was a leader," and "personnel were trained".

It was interesting to note that individuals being interviewed quickly slipped into the factors that seemed to inhibit implementation. Such thinking helps to confirm the notion that conditions that <u>hinder</u> implementation are the opposite of conditions that <u>facilitate</u> implementation. This occurs when "leadership" is given as á reason for successful implementation and "lack of leadership" is given as a reason for unsuccessful programs. This notion will continue to be studied throughout this investigatión. Each of the eight factors being explored in this study is described in

detail.

Dissatisfaction with the status quo. Chilean society has always been in conflict with itself. On one hand, Chilean people want to embrace new ideas, new technologies, and new movements of the time while, on the other hand, they want to hold on to the natural values of individual freedom and the traditional cultural values which have been inherited from earlier times. This conflict is evident in education. Chilean educators were ready for educational technology in the 1970s when movements of curriculum reform were in motion. Many educators realized that the products of educational technology offered opportunities to create visible changes so educational television and the use of audiovisual media began to be used in the universities and schools. As the definition of educational technology shifted to a process approach in the mid-1970s, there was more enthusiasm and activity in the field. The adoption of both product and process concepts reflected a dissatisfaction with the status quo--a feeling that education could be better and that educational technology was one vehicle for bringing about change.

There were problems to be solved at that time and educational technology had the potential to answer some of them, e.g., how to offer training at a distance when people could not attend classes in a specific location at a precise time; the need to perform "front-end analysis" for "needs assessment" prior to curriculum development; and the question of media influence on children.

Chilean educators were ready and the educational technology "golden years" (as they were called by some Chilean educational technologists) were approximately 1971 to 1981.

Knowledge and Skills. One of the first steps was to prepare educators for the planning and use of educational technology products and procedures. A group of Chilean academics (Roberto Char, Mariana Martelli, Adriana Vergara, and Arturo Kotesky) spent a year at Florida State University with support from the Organization of American States (OAS). Later, others were sent to the United States for graduate study at Pennsylvania State University, the University of Chicago and Teachers College, Columbia University. They returned with new ideas, new technologies, and new skills to implement them. They are the people who are most active today; many have moved "up" to administrative positions in universities (rectors, vice-rectors, directors) and in the Ministry of Education.

At the same time there were programs established for the training of teachers. Some of the people interviewed for this study indicated that large scale teacher training programs in educational technology during the decade of the 1970s was one of the reasons for success and yet, there were others who said that teacher training was not sufficient either in amount or in the number trained. The more negative people felt that the training itself may have been adequate but that it was more

theory than practice and when teachers returned to their schools, they did not have the support services that they needed to implement their new knowledge and skills.

There was also the question of sufficient numbers of trained professionals in educational technology. The number trained, probably no more than fifty (50), was just not enough for a country as large as Chile and an educational system as complex as the one that was in the process of change. There was no in-country training program at the time. Currently, there are two academic programs at the Master's level to prepare people for the field: (1) Catholic University in Valparaiso has a Master's program in Education with emphasis on curriculum, instruction and evaluation. (2) Catholic University in Santiago has a Master's program in Instructional Design. The faculty of both programs are permanent professors who emphasize the theoretical aspects of the field and other professionals from the field offer courses on application and practice. The current enrollments are 30-40 individuals in each program.

Knowledge and skills apply to both professionals who perform educational technology activities daily and teachers who use educational technology principles and practices in their teaching. Both are important and currently both appear to be insufficient.

Incentives. On the surface, there do not appear to be major rewards or incentives for participating in the educational technology movement. The interpretation of this condition (which is usually one of the strongest factors of change) is that the rewards are more intrinsic than extrinsic. Perhaps the intrinsic rewards stem from participation in innovative programs and from receiving special training. Perhaps it signifies a desire to be on the "cutting edge" of Education or being known as an up-to-date person. It is difficult to determine intrinsic rewards.

Certainly many of the early participants in educational technology in Chile have been "rewarded" with better positions and have received public recognition through successful activities and writing. Again, specific factors are difficult to discern. These people are called on for consultation (sometimes remunerative) and advice. They have been on the forefront of new developments in technology that are currently high in visibility, e.g., use of computers in educational and training.

Time. There is no evidence of pressure to produce or implement within a given period of time. There appears to be sufficient time to implement educational technology plans. The shortage of time rests more with classroom teachers who, once they have gained the skills to use educational technology procedures, do not have sufficient time to implement them. There is no "hard" evidence in the case of Chilean teachers, but this generalization was implied by individuals who were interviewed.

Another reason for the "time" variable being invisible is the concept of time in Chilean culture. It is not a hurried pace. (A view of Santiago during rush hour might cause some conflict with this observation.) There usually is very little sense of urgency like that noted in North American cultures. If something is not done today, it can be done tomorrow. This is not intended to be a criticism of a culture that is well-established, modern, and aware of itself. It is an observation of an outsider who quietly admires the comfortable pacing that may be much better than the hectic, frenetic pace observed in other parts of the world.

Resources. The creation of the Multinational Project on Educational Technology by the OAS in 1970 marked an infusion of resources into Chile. With an office in Santiago, there were ties to Chilean educational technology developments. The OAS also sponsored the training of potential Chilean educational technology leaders at Florida State University.

The International Labor Organization (ILO) provided resources for INACAP and its work in vocational and technical training. The National Institute for Vocational Training (INACAP) was founded in 1966 to train Chilean workers. The United Nations Development Program (UNDP) and ILO offered a course from July, 1971 to August, 1972 to prepare human resources personnel in educational technology. People from this course helped to create the National System of Distance Teaching (SINCAD). ILO support has been helpful throughout the years. Likewise, the Food and Agricultural Organization (FAO) has helped to fund some of INACAP's distance educational activities.

During the "golden years" (1971-1980) the Ministry of Education provided funding for some educational technology activities in the schools; most of the effort was placed on training teachers and some on the acquisition and distribution of equipment and materials. Universities also began to build Centers for Educational Technology, sometimes in conjunction with the library or a unit created for helping to improve instruction. The most lasting efforts have been the Offices of Medical Education in the Schools of Medicine throughout the country. The first such Office was probably the one established at the University of Chile in 1975. Also mentioned by several people is the Office at the University Austral in Valdivia because of the significant work of Dr. Alberto Cristoffanini, leader of the Medical Education Council within the Consortium of Rectors.

As the country faced increasing political and economic problems in the early 1980s, the resources for educational technology were reduced or withdrawn and programs, centers, and offices also faded. Some have been maintained, in the medical schools, for example and others which serve the non-formal education sector, INACAP, for example. Just as this support was reduced, the age of the microcomputer began and many of the educational technologists began to see the potential for this new tool for teaching and learning. Money was "found", pilot programs were initiated with

donated equipment and universities, in particular, adopted and implemented microcomputer technology very rapidly. Private secondary schools have led also the way in this area of development.

Evidently other resources are also tapped. The TELEDUC organization, within the Catholic University in Santiago, has received extensive help with human resources and equipment from the government of Japan. In addition, adult learners are paying for course materials, resources, examinations and tutorial assistance. Apparently many individuals are paying for continuing education that involves educational technology systems. One advertisement in El Mercurio about learning English indicates "...personalized system of instruction...based on systems for instructional design with improved efficiency of learning...audiovisual materials used...individual laboratories...learning guaranteed...." Similar advertisements for other language and computer schools reflect the use of technological systems in the teaching process. In these cases, the student pays. Resources--people, equipment, materials--are all important in the implementation of any innovation but especially with educational technology.

Leadership. The people interviewed confirmed the importance of leadership in the process of implementing an innovation. The leadership comes from many quarters; in the mid-1970s it was the Center for Educational Technology in the Ministry of Education that exerted much of the leadership; and the Council of Rectors, during the same period, sponsored an Educational Technology Commission. This Commission (Comision de Tecnologia Educativa del Consejo de Rectores--CTERC) established an environment in which personal contact among professionals in the field was possible. Monthly meetings of CTERC permitted representatives of eight universities to serve as diffusion leaders at their own institutions and also to develop a personal commitment to the emerging field (Kotesky and Calderon, 1983). The Council and Commission sponsored leadership conferences in various parts of the country that attracted as many as 300 people; 1976 in Antogfagasta; 1978 in Vina del Mar; 1980 in Santiago and 1982 in Valparaiso. Those conferences, at which research papers were given, helped to identify, solidify and maintain activities in the field. Gonzalez (1980) prepared a summary of research and development activities in the field for the Commission: 10 Anos de Tecnologia Educativa en Chile that reports over 600 "experiences" related to educational technology that occured in Chile from 1970 to 1980. He indicated that about 30% had been evaluated. It was at this time that the Chilean Association for Educational Technology (ACHTE) was organized with officers elected and meetings held. Even though it is currently inactive, it exists with Fidel Oteiza as President. The first Secretary General was Cristian Calderon and Clifton Chadwick was Executive Director.

Another factor contributing to leadership was the Multinational Project on Educational Technology with Clifton Chadwick as Principal Specialist. His vision in

promoting the Revista de Tecnologia Educativa and serving as its Editor for thirteen years, gave visibility and substance to the field not only in Chile (where it probably had a major influence) but also in other parts of Latin America.

There appears to be considerable interest in information technology by many of the individual university rectors, not by the Council, which still exists but is not as strong as it was in the mid-1970s. Conversations with four rectors confirmed their strong support and active involvement in advancing computers in their various curricula.

When the questions regarding factors that hinder adoption and implementation were asked, many answers indicated "lack of leadership". Leadership is clearly a concern among Chilean educators and is a prime factor in implementing the principles and practices of educational technology. On balance, there is probably more leadership than many people realize.

Commitment. Evidence of commitment is presented in the sections above that speak of resources and leadership. The placement of resources by a donor agency in a country where needs have been demonstrated is usually based on a commitment of both parties. Whether the commitment is short or long term depends upon the circumstances. On the other hand, when such resources are made available, there is an implied condition--if everything works out well--then, and only then, is the commitment extended.

More important is the commitment of the individuals who are directly responsible for implementation. They may be educational administrators, educational technologists, or teachers. Commitment from all three groups is probably important in matters pertaining to educational technology. There has to be sufficient confidence that a new procedure can work and that there will be sufficient persistence to stay with it to help make it work. Pilot projects point the way but they are not the 'stuff" that established programs are made of. The stronger the commitment by all the parties involved, the more likely the innovation will succeed. The risk is that this same strength can foster failure if the innovation does not work. Educational technologists are usually risk-takers. They need to find and work with administrators and teachers who are willing to share the risk.

In Chile, there seemed to be a strong commitment by "top" officials in the Ministry of Education and the universities. The educational technologists were committed. The real question of commitment centers on the teachers (as it often does) and, and, as one rector said, "Educational technology is a burden for teachers." Perhaps this is why many innovations never become institutionalized in schools. Commitment is necessary--all the way.

Participation. There seems to be sufficient evidence to indicate that there was both

horizontal and vertical participation in educational technology. Horizontal participation refers to the individuals who hold similar positions, i.e., rectors and vice rectors, educational technologists, curriculum planners, teachers; vertical participation is the activity of all relevant personnel in a single institution or organization, i.e., in one university: the rector/vice rector, educational technologist, department chairs and professors. The Council of Rectors provided wide participation for top administrators; ACHTE and the Council-sponsored conferences were the vehicles for educational technologist's participation and academic departments, while not as strong a force as the Council or ACHTE, nevertheless provided opportunities for participation. The educational technologists often provided the support services which encouraged local participation. There is no evidence of such participation being forced. Teacher participation seemed to be minimal.

Documentation

There appears to be a reasonable amount of educational technology literature in Chile. One prime source, the Revista de Tecnologia Educativa, has been published continuously since 1973. Its audience is primarily Spanish-speaking Latin America and the Editor has always been located in Latin America except for the first issue which was edited in Washington, D.C. by Dr. John S. Clayton, of the OAS and was called the Boletin de Tecnologia Educativa. A disproportionate number of authors are Chilean. The journal was initiated with OAS funds but now, subscriptions and the Ministry of Education are the prime sources of support.

Other Chilean education journals feature articles on various aspects of educational technology from time to time. For example, Perspectiva Educacional, published by the Catholic University in Valparaiso devoted an entire issue (No. 4, 1982) to papers given at an educational technology conference held there a few months earlier. Dialogos Educactionales, published by the University of Playa Ancha in Valparaiso, devoted No. 7, 1986 to "Education, the Press and Television". The Revista de Educacion, published in Chile, also contains articles related to educational technology. Chadwick's Tecnologia Educativa Para Docentes (1975 and 1987) is well known in the country.

The fact tht UNESCO's Regional Office for Education in Latin America and the Caribbean (OREALC) is located in Santiago means a closer relationship with local educators than those who are further away. All publications are in Spanish and the regularly published Bulletin is also published in English. The publications list contains titles related to educational technology. One current monograph, Information, Education and the Public Sector (1988) was written by a leading educational technologist, Fidel Oteiza. The well-known UNESCO journal, Prospects, published in Paris in several languages, regularly contains articles by Chilean educational technologists. For example, Fidel Oteiza wrote, "Informatics

and Education: The Situation in Latin America" (Vol XVII, No. 4, 1987) and Miguel Reyes wrote "Education of TV Audiences: Nature and Objectives" (Vol XVI, No. 3, 1986).

Reviews of Chadwick (1984; 1986) and Kotesky and Calderon (1983) provide an extensive bibliography of Chilean information sources, mostly in Spanish.

In addition to the usual translations of basic books that one expects to find, there is a variety of original volumes devoted to special aspects of the field, e.g., Luis E. Gonzalez and Salomon Magendzo from the Interdisciplinary Program in Educational Research (PIIE) have written Despues de la Educacion Media: Exito o Fracaso? Gabriela Lira, Los Principios de la Instruccion Programada; Sergio Elliot, Sistemas Autoinstruccionales a Distancia (for FAO) and Chadwick and Rojas, Glosario de Tecnologia Educativa.

REDUC (Red Educacion--Latin American Information and Documentation Network on Education) has its central office in Santiago. The information paced in this database come from Latin American sources and are available in Spanish and Portugese. It was established in 1979 and at the time of this report, there were more than 6,000 items available through printed publications, microfiche and online.

There is a literature of educational technology in Spanish written by Chileans. Diffusion and use of the literature is another matter but it does exist and no practicing professional should feel that he/she is isolated because of the lack of information in the Spanish language.

Additional Observations

Educational technology is alive and well in Chile but it needs a new name. There seem to be so many negative associations with the term that they may retard further development. The perceptions are largely held by non-educational technologists--usually educators who have adopted the "product" definition and have not changed that focus even though the field has moved to a "process" definition. The strong influence of programmed instruction in the 1960s and instructional systems in the 1970s galvanized the concept in the minds of many. Consequently, there is a barrier when talking about educational technology (process definition) and educational technology (product definition).

Not many professional educators will admit to being called "educational technologists" partly because of the misinterpretation and partly because they view themselves in different roles even though their beliefs, values, teaching and research activities, and networks involve applications of educational technology theory and practice. This is one reason that it is difficult to say that there is a field of educational technology in Chile; it is more like a movement--a movement to which

many people belong, not only practitioners of educational technology but supporters of the concepts, principles, and procedures of the field. Thus, rectors and vice rectors from several universities are part of the movement as are some curriculum specialists (who might not agree with this interpretation), instructional developers, evaluators, and distance education personnel. One gets the impression that the "movement" is there but not a well-defined field.

The movement is strongest in the universities and agencies involved in training. The two dominant observations were of large computer laboratories, usually equipped with microcomputers at every university and training activities that were designed for and used at a distance. In both instances, educational technology products and processes were in evidence. However, the computer presence at most universities was for use as a tool and students were taught how to use it but they did not learn from it. In other words, computer-assisted instruction (CAI) or computer-assisted learning (CAL) was seldom the purpose for using the computer. Some research and development activities on the use of microcomputers to teach mathematical concepts was being done at the University of Santiago. Younger children have been motivated to try LOGO whenever they could have access to a microcomputer because of a TELEDUC course that featured computers in education and published reference books on LOGO and other applications. Microcomputers are rarely found in public primary and secondary schools (except for pilot experiments) but can be found in many private secondary schools which represent about 20% of all secondary schools in the country. Again, the use seems to be to teach students how to use computers. Chile has an admirable record statistically. A 1986 UNESCO report (Oteiza, 1986) says that there are more than 35,000 personal computers in Chile and that 500 educational institutions have more than three microcomputers. There have been more than 150 research studies and experiments in the schools. Since 1979, more than 450 teachers have completed a university-level course on computers in education. All these facts do not spell out how computers are being used or what the studies found. One senses activity even though it is difficult to learn about the specifics.

The other observation is about distance education. Chile has not created an open university like Venezuela or Costa Rica, but it is engaged in several distance education programs that require educational technology procedures to operate. There is a program in educational guidance offered at a distance by the University of the North in Antofagasta and TELEDUC is offered entirely at a distance with the primary information coming from television and complementary, specially designed learning materials. The other major program is the vocational and technical training offered at a distance by INACAP.

The INACAP program and others within business, industry, and the armed forces (which emphasize training, not education) are actively using the principles, practices and products of educational technology to prepare employees for specific

jobs. Many educational technologists are actively involved in these training activities. As in other countries, business, industry and the military have discovered educational technology can deliver the type of instruction that guarantees learning--an absolute requirement for optimum performance on the job. Education, in the formal sense, does not always prepare students for the world of work. Many educators will say that a job is not the purpose of education and therefore educational technology does not belong in the schools. Such a spurious argument should be interpreted as an excuse which has questionable substance.

The use of microcomputers and telecommunications has opened up new networks within the country and with other nations. A consortium of university libraries and special libraries have joined the National Library to form the National Bibliographic Information Network (RENIB). There is now an online union catalog of all the holdings of the participating libraries. Chile has joined the international electronic mail network, BITNET. (While the investigator was in Chile, he sent and received messages to and from Holland and the United States using BITNET.)

With all of these activities, many as current as developments in other parts of the more developed world, there still is a ubiquitous feeling of poverty. The reason most often given for lack of program development or change was "lack of funds". While such statements could be excuses, there really is insufficient capital to make huge investments in education. Salaries of teachers and books are higher priorities than any innovation no matter how exciting and potentially useful it might be. Money can be found by working with donor agencies; by proposing projects to international organizations; by establishing partnerships with business and industry and by asking students to pay some for their course materials. Some programs are more favored than others when it comes to budget allocations. Kotesky and Calderson (1983) observe that, "In Chile, educational technology continues to be a discovery for the elite, generally associated with higher education. During the 70s Chile generated an infrastructure which could permit the creation of a graduate program in educational technology." But it was not done then and the two programs that exist now focus on instructional design rather than educational technology <u>per se.</u>

Beyond all these specific efforts there is a deep concern for equity in education. Despite private schools and the new municipalization of education (shifting fiscal responsibility from the national level to local communities) there is increasing activity in popular education (educacion popular) that is based within the community, involving parents, concerning basic education and training needs, and using many residents in the planning, operation and monitoring process. Whether or not educational technology has a part to play in this process may be the real test of whether or not the basic concepts of the field have changed and are broad enough to include the problem solving approach which begins with human needs.

Any assessment of current status should build on any previous works that have attempted to do the same thing. The recommendations of Kotesky and Calderon (1983) are worth repeating in light of this study which took place six years before this report.

1. "...educational technology and other technical advisory bodies should advise the use of unsophisticated techniques and materials." (p.45)

   There apparently is a move to embrace the more contemporary information technologies, especially in the universities. There is not much movement in most public primary and secondary schools. Private schools may be an exception. Luis Eduardo Gonzalez of PIIE has just finished an manuscript for the UNESCO Regional Center on the development and use of low cost teaching materials.

2. "During the 70s, Chile generated an infrastructure which could permit the creation of a graduate program in Educational Technology." (p. 45)

   Two Master's level programs currently exist: one at the Catholic University in Santiago (Instructional Design) and the other at the Catholic University in Valparaiso (Curriculum Development with a strong emphasis on instructional planning, delivery and evaluation).

3. "Given the centralized characteristics of the Chilean education system, educational technology could be used as a tool for revising and validating curricula." (p. 45)

   There does not appear to be any move in this direction. In fact, there appears to be some stress between the curriculum and educational technology people.

4. "Technological universities preparing professors and researchers through graduate programs should complement their training by including this discipline as part of their curriculum." (p. 45)

   The medical faculties seem to have realized the value of some pedagogical education. The Offices of Medical Education at universities where there are medical faculties, have created courses, workshops, seminars, and reference materials to help physician-professors to become competent teachers. There is not much evidence of other faculties doing the same.

5. "A task for the 80s should be the creation of a Latin American Educational Resources Information Center (ERIC) linked to the

Northamerican ERIC." (p. 45)

> The continued development of REDUC with its Latin American Spanish language sources make it an ideal complement to ERIC. It is conceptually the same as the Northamerican ERIC even though it is not entirely compatible. The authors of the 1983 article did not recognize REDUC as a potential information system. Actions are currently underway to establish cooperation.

PERU

Introduction

As with the reports of the other countries, we will begin with a summary statement, using the questions upon which the study was based. Each statement will be amplified in the main body of the report.

Summary

1. There is no general agreement about the definition of educational technology in Peru. In fact, the term has been rejected by some, modified by others and changed entirely (to "popular education") by still others.
2. There are people who consider themselves to be in the field of educational technology but, as in Chile, they are more likely to be part of the "movement".
3. Educational technology programs do exist under a variety of labels in the Ministry of Education, e.g., at the National Institute for Educational TV and the National Institute for Research and Development in Education; in universities, in public and private sector training programs but not much in the public schools.
4. There are opinion leaders who hold the respect of their colleagues. They are as diverse as Adriana Flores de Saco, Professor of Educational Technology at the Catholic University in Lima, Agustin Campos, Professor of Educational Technology at the Womens University of the Sacred Heart, Danilo Ordonez, Director, Newton Institute; Jorge Capella, Dean of the Faculty of Education at the Catholic University in Lima; Walter Penaloza, now in the higher education system of Venezuela; and Rosa Saco de Cueto, head of the Educational Television Center at the Catholic University in Lima.
5. There do not seem to be diffusion networks through which educational technology information flows. People with common interests know others but communication appears to be minimal.
6. Most of the conditions which facilitate adoption and implementation of educational innovations (such as educational technology) are present but several conditions seem to dominate and several are very weak. Conditions which hinder innovation are more frequently mentioned.
7. There is more documentation about educational technology in Peru than in Chile or Indonesia, much of it original and most of it widely distributed.

There is no general agreement about the definition of educational technology.

Any discussion of education, educational technology, or educational research and development in Peru is usually preceded by briefings, discussions, interpretations and reaction to the political. social and economic realities of the country. Before any

discussions of education, educational technology or educational research and development in Peru, one must undergo briefings, discussions, interpretations and reactions to the political, social and economic realities of the country. When Cassandra Fletcher completed her study in 1984--a study which was similar in many ways to this one, she concluded that:

> The research suggests that the outcomes of the innovation-diffusion process of educational technology in Peru were largely shaped by the macrosocietal, or context variables such as history, culture politics, and economics , rather than micro level determinants, such as attributes of the innovation and adopter traits. (p. iii)

There was no new evidence five years later to change this conclusion in any way. Educational technology has generated sufficient interest to be considered, discussed, altered and made operational in a variety of ways. The discussion about educational technology in Peru as been particularly active in debating how the process of planning and delivery of education can be based on participatory analysis and methods which take a changing context and problem solving approach into account.

The term, "educational technology," in Peru has come to mean many different things to different people and the typical North American definition (AECT, 1977) is only one dimension of the discussion and search for a place in the strategy for education. The dimensions sometimes vary considerably from standard definitions used in other countries involved in this study. Rather than to use only one local definition which coincides with definitions used in other countries, it is probably more helpful to first present the characteristics of four definitions currently used in Peru and discussed by Morillo (1987).

Educational Technology I--equipment and materials that assist in the process of teaching; the old concept of "audiovisual aids" would be an equivalent identification. In this definition, the emphasis is on teaching with instructional resources.

Educational Technology II--emphasizes the use of methods, techniques and procedures with a focus on learning--the student is the principle user of the resources;

Educational Technology III--systematic analysis and planning of the totality of teaching and learning with an emphasis on problem solving using standard scientific procedures; and

Educational Technology IV--a broader concept of technology in the service of people who live and work in a unique social context; educational technology in this definition is the process of participatory needs

assessment, problem solving, and consideration of alternative ways to resolve the problem.

The last definition (or, perhaps more accurately, concept) has three dimensions in the Peruvian context that help to describe it: humanistic educational technology, non-directive educational technology, and non-directive liberation education.

Humanistic educational technology was first proposed in Peru by Dr. Walter Penaloza in the 1950s and 1960s. Penaloza wanted to democratize education for the masses, an approach which was in direct conflict with the semifeudal domination of education during those years. He proposed new content, new methods and a new orientation to education that encompassed the exigencies of modernization and democratization of education. His approach conflicted with the most obscure and reactionary forces that were pulling in other directions at the time. The most important element in Penaloza's argument is that the learner identifies himself/herself with the culture and its development; to do so is to be educated. Penaloza proposes five levels of education technology in his book, Tecnologia Educativa (1979):

1. The curriculum
2. The methods or curricular blocks (or courses)
3. The auxiliary instruments of the education process
4. Systems of learning
5. Evaluation

Non-directive educational technology could be classified in the "inductive" or "discovery" learning category. The student becomes an investigator using the logic of scientific research. Juan Rivera Palomino, one of its advocates, says that the method is not unaware of the need for planning but the objective of the planning is to discover answers or further questions with a lot of freedom allowed by the teacher so that students can make their own explorations and their own decisions. The method, in Peru, is called Initial Education (Educacion Inicial) and refers primarily to preschool learning.

Non-Directive Liberation Education proposes learning with complete freedom to develop the potentials and the genuine interests of the individual. Its proponents are Ivan Illich, Paulo Friere, Carl Rogers and, in Peru, Juan Rivera Palomino.

All of this background does not add up to one definition but a series of conceptual elements that do not fit together because of their internal inconsistencies. What they do say is that educational technology, as it is defined in Peru, is not the same as in North America and other parts of the World. That does not mean that it is "wrong" or "inadequate" but, rather, that it has engendered sufficient interest to be considered, discussed, altered, and made operational on its own terms. We must understand those terms if we are to understand educational technology in Peru.

Current Definition

In Peru, educational technology is defined by practicing professionals as a systematic process for designing instruction to meet the needs of individual learners in all environments where teaching takes place. It embraces the use of communications media as primary delivery systems.

The dimensions of this definition do not vary from standard definitions used in other countries within this study. Therefore, to insure consistency, it will be helpful to conceptualize educational technology for Peru in the same way it has been used in Chile and Indonesia. (There are some aspects of the Peruvian definition that are also used in Chile.)

In seeking places of activity and people who are active in educational technology, it was necessary to continue to follow consistent elements that are used in other countries and which are considered acceptable elements in educational programs in all the definitions used in Peru. The characteristics that fall within the scope of an operational definition, therefore, are:

1. Use of products: there is a visible use of a medium (such as television) to deliver information for teaching and learning.
2. Use of procedures: there is a conscious systematic process of instructional design or development being used to create or revise curricula, courses, units or lessons. This process usually follows a standard instructional development model.
3. There are professionals who have been trained to develop/evaluate teaching and learning materials and procedures.
4. The purpose of the operation is to improve learning at less cost.

Following these criteria it was possible to determine that there is educational technology activity taking place in a variety of locations throughout Peru under a variety of names.

There are people who consider themselves to be in the field of educational technology.

When an announcement was made that a visiting educational technologist would deliver a lecture at the Pontifical Catholic University in Lima, the hall accomodating fifty or so people was full and overflowing. At the end of the session, which invaded the lunch period for more than an hour, someone remarked that this was the first time in many years that educational technologists (or those interested in the field) met together. Apparently, there is an interest in the field as it has been redefined in Peru and there are people who identify with it. However, it is difficult to find people whose jobs would be described as "educational technology" or whose

work would fall entirely within the scope of the field.

There are people who are specialists in educational television at Institute for Telecommunications (INTE) and the Center for Educational Television at the Catholic University (CETUC). There are individuals who are engaged in preparation of teachers and other educational specialists at the universities who teach courses in educational technology. The Minister of Education and the Institute for Research and Development in Education (INIDE) operate projects that are clearly within the realm of the field and there are those in communication science academic programs at the University of Lima and the University of Piura who identify with the movement. The Institute for Latin America (IPAL) focuses on the social impact of communications technology and the National Institute for Research and Training in Telecommunications (INICTEL) conducts a three prong agenda in the engineering aspects of telecommunications: research & development, training, and consultation.

Individuals are enrolled in academic programs at the Pontifical Catholic University and the National University in Trujillo which prepare them, to some extent, to serve in educational technology positions or other education and training positions requiring educational technology competencies.

During this study there seemed to be no end of names of people "you should talk with." When asked to nominate three Peruvians who influenced the field, 33 names were volunteered, 15 of them more than once. There must be a few educational technologists in the country whether they realize it or not!

Educational technology programs exist and have been institutionalized.

A "program" is an activity that falls within the scope of the operational educational technology definition. It can be an any level, any location and be fully devoted to the field or only partially involved. Some of the programs are obvious by their names:

Center for Educational Television of the Catholic University (CETUC)
National Institute for Educational Television (INTE)
Center for Educational Technology, National University of Piura
National Institute for Research and Training in Telecommunications (INICTEL)

Other programs require further exploration before they "qualify" for inclusion on the list. SENATI has used systematic instructional development procedures for vocational education for many years; the International Potato Center (CIP) prepares training materials for worldwide use; and academic programs at the Catholic University in Lima, the National University in Trujillo, the Women's University of the Sacred Heart, and the University of Lima are sufficiently "in" the circle

because of their teaching programs.

When Peruvian educators were asked to name "centers of activity," 23 different places were mentioned, 16 more than once. Most frequently named centers were INIDE (National Institute for Research and Development in Education), the Catholic University in Lima, the University of Lima, the National University of Trujillo and INTE--in that order.

There was not much evidence of educational technology in business and industry training programs. Maybe the "right" persons were not addressed; perhaps the people interviewed simply did not know, or maybe they do not exist. There were some references to training development by contract; that is, companies that specialize in the development and delivery of training on a one time basis and then withdraw when the work is completed.

Medical faculties expressed much interest in the area of instructional development especially at the University of Trujillo and Cayeteno Heredia University.

There are opinion leaders who have been responsible for the diffusion of educational technology.

The opinion leaders come from inside and outside the country. There are those whose influence is direct because of their active participation in the growth and development of the field and there are those whose influence is derived from their written works. The active people are more likely to be the leaders, while the authors are the "thinkers" who propose rationale and theory for the field but are generally remote from practice. The names most frequently mentioned as "leaders in the educational technology movement in Peru" are:

Adriana Flores de Saco, Professor of Education with specialization in educational technology, Pontifical Catholic University, Lima;

Augustin Campos, Professor of Education, Women's University of the Sacred Heart, where he heads a Master's program in the field;

Walter Penaloza, retired Professor of Education from the University of San Marcos in Lima and currently Vice Rector of the Regional University of Zulia in Venezuela;

Jorge Capella, Dean of the Faculty of Education, Pontifical Catholic University, Lima;

Danilo Ordonez, Director, Newton Institute, Lima and part-time Professor of Educational Technology, Pontifical Catholic University; and

Rosa Saco de Cueto, Professor of Educational Technology and Director, Center for Educational Television at the Pontifical Catholic University

There were 46 nominations in all, 25 of whom received more than one endorsement. There are several interesting interpretations of these data.

1. All of the frequently mentioned people nominated are associated with universities;
2. Three (Flores, Capella and Saco) are on the faculty of the Pontifical Catholic University in Lima and Ordonez is a part-time professor at the same University.
3. Penaloza is no longer in Peru; he has been associated with the Venezuelan university system since 1979.
4. Both Penaloza and Capella have written well-known books about educational technology but have not served (in any recorded way) as "practitioners" of educational technology.
5. The long list of individuals perceived to be leaders may be due to (a) the experience of the respondants; (b) the diverse interpretation of what constitutes the field; or (c) the dispersed nature of educational technology activity in the country.

The fact that there is no professional association in the field tends to diffuse the possibility of identifying leaders. In most studies of influential leaders in a field, those who have held national offices are recognized as leaders; the same is true of those who have written extensively.

The names of external people frequently mentioned were: Clifton Chadwick, Robert Gagne, Benjamin Bloom, and Walter Dick. Chadwick visited Peru when he was located at the OAS Multinational Project from Santiago and his writing in is well-known. He also served as Editor of the Revista de Tecnologia Educativa for more than ten years. Gagne and Dick, both from Florida State University, have visited Peru for brief periods to offer intensive courses or deliver a series of lectures. They have published extensively and their works have been translated into Spanish. They have international reputations as authors of seminal works and, as professors, have taught graduate students from Peru. Bloom's classic contribution, Taxonomy of Educational Objectives: The Cognitive Domain, makes him a prime candidate for an influential person. His translated works, including more recent books on mastery learning, are widely used in educational technology and other professional education programs in Peru. It was not determined if he has ever visited or worked in Peru or if he has taught or advised graduate students from that country.

There do not seem to be diffusion networks through which educational technology information flows.

There are informal groups of people who seem to know one another but these groups do not appear to share information. They tend to be organized around basic themes: (1) communications; (2) telecommunications, mostly from an engineering point of view; (3) teleducation, the producers of specific programs for teaching and learning; (4) informatics, i.e., those who work with computers and telecommunications and (5) the traditional educational technology types most of whom were educated in North America and helped to introduce educational

technology as part of the education reform.

As a Fulbright researcher/lecturer, the author gave a number of lectures during June, 1989. It was interesting to see the invitation lists develop by each sponsoring organization. Many individuals were on more than one list and several people received invitations from different sources. Even though there may not be formal diffusion networks, informal networking goes on and professionals related in some way to information/educational technology do communicate with one another. However, there are no organizations or associations to bring like-minded professionals together.

During the interviews, key people were asked to nominate individuals who they considered to be "leaders" in Peruvian educational technology. Most of them struggled with this question. Seldom did any one immediately give three names. Each person seemed to search his/her memory for names and it was evident that it was a difficult question for most of them. For the names that did emerge as the top eleven, there appears to be no connecting links that would establish networks. The fact that four persons are related to one institution (Pontifical Catholic University) is as close as one can get to discovering a network.

There are no publications specifically devoted to educational technology so that vehicle is closed off. As for education information in general, INIDE is a regional center for REDUC, the Chile-based research information system which is fully operational and has 25 other centers throughout Latin America. This is a network of another sort.

Most of the conditions which facilitate adoption and implementation of educational technology are present in Peru.

All the conditions which were being tested in the study were present to some degree but certain factors dominated and others were barely recognized. The conditions that dominated the list, in descending order of mention by the 120 people who responded to the questionnaire or were interviewed, are as follows:

1. Dissatisfaction with the status quo
2. Need for knowledge and skills
3. Availability of resources
4. Leadership
5. Participation

There was weak support of conditions related to:

6. Incentives
7. Commitment
8. Time

The three low-ranked conditions were somewhat of a surprise since they are usually rated higher in other studies. One hypothesis for the perceptions of low rankings is that people still remember the education reform movement of the 1970s with which educational technology had a close identity. There were not many rewards for accepting the new procedures of reform nor was sufficient time provided to learn, to plan, and to implement the new ideas. The only commitment required was generally to the Ministry of Education and to the local school. Since the revised curriculum was thrust upon teachers, there is still some concern about commitment and the extent to which people ought to go to sustain a commitment. Details concerning each condition are provided in the following sections.

Dissatisfaction with the status quo. No one used the phrase, "dissatisfaction with the status quo" but the greatest number of responses reflected this view. Responses to questions regarding reasons for the acceptance and non-acceptance of educational technology included such statements as: "a new educational system was needed," "it was the right innovation at the right time in the right place," "It was a symbol of progress and modernization," and "it paralleled educational and political reform". All such statements reflected dissatisfaction with the current effort.

When respondants spoke of factors that hinder adoption and implementation, they referred to reasons that also indicated a "dissatisfaction with the status quo": "social-cultural context not considered," "the reality of the Peruvian situation is the most important variable," and "the failure of educational reform". These statements also can be interpreted to support the dissatisfaction hypothesis.

Need for knowledge and skills. The second most frequently mentioned reason indicated that attention to the attainment of knowledge and skills was high on the list of reasons for implementation. More than half the respondants said that the training of personnel had contributed to the acceptance and use of educational technology concepts. At the same time, those who identified barriers mentioned "insufficient knowledge," "lack of training," and "too many people to be trained". It is clear that installation of educational technology programs require extensive training to meet their needs.

Resources available. When economic resources are available, clearly implementation is facilitated. Respondants said: "Sufficient economic and human resources" must be provided. It was often pointed out that private schools and universities had "all the money" and consequently the resources to implement programs; state schools and universities were stumbling along with only a few materials. People were quite vocal about the "lack of resources". The non-existence

of funds prohibited many of the good ideas from educational technology to be adopted. The government (i.e., the Ministry of Education) was seen as the culprit. A number of private schools tapped non-governmental organizations and foreign donors for contributions of specific resources, e.g., television studios, radio station, computer hardware and software and subsidies for special in-service programs.

Leadership. "There were motivated and enthusiastic leaders" was frequently stated as a reason for implementation of educational technology. At the same time, one of the most frequently mentioned reasons for non-implementation was "lack of leadership". It was noted that the people who were trained in educational technology were not sufficiently prepared to lead. Whether it was a basic lack of knowledge, a personality trait, or political inepitude, no hint was given.

Participation. It was clear from the many responses that participation was a key element in the acceptance or rejection of educational technology. Where it was imposed from "above" (as it was in many cases) the users perceived no participation in the adoption and implementation process. They felt that they could not endorse any program in which they had no part to play either in the decision to adopt or the manner of implementation.

The above conditions were most frequently mentioned as being important in the diffusion and implementation of educational technology in Peru. Other reasons, at a lower level of magnitude, were: (1) incentives/rewards; (2) commitment; and (3) time. They are worth mentioning even though they were not perceived to be key factors.

Incentives. Conventional wisdom would normally place incentives and rewards high on the list of factors which facilitate change. However, the respondants in Peru apparently did not see any incentives for accepting educational technology. There were even disincentives when teachers were encouraged to take educational technology courses at a distance and had to pay for them. The people from INIDE said that no one finished the courses and they were eventually discontinued. A number of respondants actually mentioned "lack of incentives" as a reason for not implementing educational technology. If there were any rewards at all, they had to be intrinsic because there is no evidence of extrinsic rewards for adopting and using the products and processes of educational technology.

Commitment. The commitment to educational technology rested primarily with the people who had been trained at Florida State University. They formed a critical mass in the Ministry of Education (INIDE and INTE) and were centrally involved in the education reform movement. The commitment was not shared by those who were to be the ultimate users of the reform materials and procedures. Apparently there was commitment from "above" but the lack of participation by the

users prevented similar commitment at the local level.

Time. Apparently time was not a dominant consideration in the adoption and implementation process. Perhaps time was considered as a resource; perhaps was considered to be one aspect of gaining knowledge and skills. In any case, it did not appear as a major factor in this inquiry.

Documentation

There is a distinctive literature in the field of educational technology in Peru. The documentation and publications that exist go beyond the translation of North American books, which also exist. The literature seems to be classified in several categories: (1) philosophy and theory related to educational technology, including active criticism of the approach; (2) applications of educational technology to practical events of teaching and learning, on all levels, formal and nonformal; (3) the psychological and sociological impact of media and technology on learners of all ages; and (4) educational technology reinterpreted as popular education.

The Peruvian National Bibliography of Education 1930-1980 (INIDE, 1981) uses a variety of descriptors to encompass the field:

Educational technology	Radio in education
Technology in education	Distance education
Educational television	Audiovisual education
Television in education	Audiovisual aids
Cinema in education	Educational films
Education and mass media	

Beyond these specific descriptors are the more general terms such as Teaching, Learning, Evaluation, Curriculum, Materials, Methods--any of which could be related to educational technology. There are no descriptors directly related to computers or informatics.

The first educational technology entries in the National Bibliography appear in 1965, a text on educational television by the National Institute for Educational Television (INTE) and then, in 1968, a monograph The Revolution for Education by Mario Samame Boggio (who became Director of the Consejo Nacional de la Universidad Peruano in 1975 and Minister of Energy and Mines in 1989). There was a single publication in 1969, Educational Reform and Educational Technology by Orlando Figueroa Valasquez. INTE appears to have had several publications in 1970 but nothing on educational technology appeared until 1974 when INIDE published its Development Plan for Educational Technology in six volumes. It spelled out the details of educational technology's role in the future of Peruvian education. From that point on there were several publications each year on educational technology and educational television which appeared to be on parallel paths moving toward similar objectives.

The published criticisms of educational technology began to appear in 1986 with the publication of Uses and Abuses of Educational Technology, a symposium report in which various leading educators debated the merits of educational technology in the Peruvian education system. Walter Penaloza Ramella appealed for a more humanistic approach while Juan Rivera Palomino voiced some philosophic concerns about the appropriateness of educational technology in Peruvian schools. Rivera published Education, Educational Technolgy Domination (Educacion, Dominacion Tecnologia Educativa) in 1987. Both publications have had more than three printings which may be an indicator of the interest in the message of these volumes. Rivera is a constructive critic who views the field from "inside". He is the author of Educacion Inicial: Tecnologia Educativa (1980) which includes an extensive discussion of educational technology and its relationship to early childhood education and adult education and Guia Didactica de Educacion Inicial (1981) which deals with classroom applications of educational technology principles and practices. One article, "Tecnologia Educativa y Proyecto de Educacion Popular" ("Educational Technology and the Popular Education Project") by Emilio Morillo Miranda appears in Cantuta (No. 12-13) published by the National University of Education. This article provides one of the best overviews of educational technology in Peru as of the late 1980s. It analyzes the various definitions of educational technology and discusses the criticisms of Penaloza and Rivera. It then places educational technology in the context of "educacion popular", the uniquely Peruvian education movement that is highly participatory and community-based.

The social communication literature emphasizes the effects of mass media on people of all ages but especially children. An excellent collection of essays, Educacion y Comunicacion Popular en el Peru was published in 1985 by the Institute for Latin America (IPAL). IPAL also publishes ntc/nct, a newletter for South/North exchange of information on new communication technologies. It is published twice a year in English and in Spanish.

There have been several dissertations that have focused on educational technology development in Peru. The most thorough and comprehensive is Cassandra Fletcher's 1980 study, Educational Technology in Peru, 1968-1980; A Case Study of Diffusion of an Innovation Within a National Education System. There have been other studies which look at Peruvian educational technology development within a Latin American context, e.g., Carmen Siri, An Assessment of Educational Technology Information Needs and the Status of Information Services in Latin America (1977) and John Tiffin's study, Problem Structures in ITV Systems in Latin America (1976). Each of these studies was a Ph.D. dissertation completed at Florida State University.

More current studies completed in Peru are reported in Resumenes Analiticos en Educacion published by INIDE in 1987 and Catalogo Nacional de Investicaciones

Educacionales Lima Metropolitana 1970-1986 and Catalogo Nacional de Investigaciones Provincias 1972-1983. Both volumes contain abstracts of educational technology studies.

Special mention should be made of the National Center of Educational Documentation and Information (CENDIE) which is housed physically and administratively within INIDE. CENDIE not only collects, processes and stores relevant information on education and the related social sciences, it also has an active publications and dissemination program. Several of the items mentioned above come from this effort. Also focusing on education and information technology, are (1) specialized bibliographies (e.g., No. 38, "Education and Media of Social Communication" which contains 198 listings); (2) journal contents alerting service (with tables of contents from such Spanish language journals as the Revista de Tecnologia Educativa and Informatica Educativa) and (3) a regularly published journal, Revista de Informacion y Documentacion Educacional, which covers topics often related to education and information technology.

There is published information about educational technology available in Peru. It is concentrated in CENDIE but can also be found in University libraries in Lima, especially the Pontifical Catholic University, the University of Lima and the University of the Pacific. There are databases located within several organizations, some of which are uniquely Peruvian (e.g., IPAL's database) and others are part of Latin American databases (e.g., REDUC; SAIT; RITLA; and SIT). The provinces are much more limited in their resources.

Additional Observations

In the course of interviews and visitations topics were discussed which are not directly related to the study but help to describe the current status of the field in Peru. Likewise, observations inside offices, classrooms, libraries and other facilities show equipment and materials that are considered to be part of the field's development. Through popular media such as newspapers, television, and radio new information is disseminated and it is added to the general knowledge about the status of the field. These observations constitute the final section of the report regarding the status of educational technology development in Peru.

The definition of educational technology in Peru has evolved into a multi-conceptual framework which includes, among other characteristics, educacion popular (popular education). This community-based activity seeks to serve all learners from pre-school through adults by providing alternative educational opportunities that do not always resemble the traditional schools and learning programs. The manifestations of educational technology, i.e., the hardware and software, often do not exist but the openness to new ideas does. The term

"educational technology" lives on but with many negative connotations that sometimes make the term unusable. This interpretation stems from the late 1960s and early 1970s when behavioral objectives were paramount and instructional systems were viewed as lockstep, rigid procedures which denied or discouraged teacher intervention. This interpretation is so widely diffused that it would be better to use new terminology to describe the field and to develop it further.

Many of the people who were identified with the field in the early 1970s have left the field to assume other positions in Peru and other Latin American countries. Most of these people came from INIDE and were trained at Florida State University. Some have moved on to assume management positions in government; some have become private consultants who develop and run training programs for businees, industry, and the government. Only a few have returned to the schools and a few have become full time university lecturers.

There is very little coordination of educational technololgy in Peru. It has become a movement rather than a field. It is fragmented into specializations such as educational television, instructional design and development, media studies, and distance education. People involved in these specializations do not seem to talk with people in related specializations. There is an emerging interest in the use of the computer in education but no defined group of individuals has emerged. Much of the activity is focused on private organizations and agencies that use a variety of technologies but no professional associations have emerged. The universities are another location of activities related to the field with some courses being offered but no real preparation for a career, except perhaps at the two universities that offer Master's degrees in the field at the Pontifical Catholic University and the National University of Trujillo. Medical schools seem to have equipment, materials and personnel to support teaching with media and technology. There appears to be little interest in cooperation because each person or group is involved in its own activities and sees no special benefit in collaboration. Consequently, there is very little communication among professionals in the field and no obvious leadership emerging. The public schools are almost untouched by any aspect of educational technology. There is some residue of the curriculum reform of the mid-1970s but its impact seems to be minimal.

There appears to be an eagerness to participate in the information technology developments that are obvious in almost every country of the world, regardless of their state of development. Business and industry have adopted computer technology as have many governmental agencies and the military. Universities have computer laboratories for science, mathematics and engineering but less for other disciplines. Private secondary schools offer computer literacy courses but there is almost no activity in the public primary and secondary schools. Private business schools advertise every day in the newpapers to attract students to training courses which promise jobs using computers. A National Project on Informatics has

been established in the Office of the President and has been given resources to develop a plan for using the new information technology in the government and the society.

Television continues to survive. INTE, within the Ministry of Education, has been in business for 20 years. It continues to develop curriculum-related programs and special programs for preschool learners and adults. On 17 June 1989, President Alan Garcia announced the opening of satellite network for secondary schools. The US has offered transponder space on a NASA satellite for $1.00 and it is likely that the offer will be accepted. The President spoke enthusiastically about the potential for educational television in the country.

The conditions that facilitate and hinder change are about the same in Peru as in other countries of the world. The special case of Peru involves extreme politization of nearly every citizen. It is difficult to discuss any topic in education (or any other sector for that matter) without first reviewing the current government position on matters of the day. This topic is soon followed by an economic analysis that focuses on hyperinflation, devaluation, and financial realities. Once these matters are discussed, it may be possible consider to education and curricular issues. Far down on the priority list are matters pertaining to educational technology. Those discussions are clouded by the lack of understanding about the field and the misperception that any use of educational technology involves large investments of capital to purchase imported goods. Until these misconceptions are changed, and the urgency of education matters is highlighted, not much progress can be expected in either area. More fundamentally, until the political and economic crises are resolved, not much progress will be made on any front.

This study was more about people than politics. Even though the political and economic realities cannot be ignored, people do not want to mark time as the rest of the world marches on. There are many alert and intelligent people in Peru who know what could be done to improve education; many of those people envision the use of educational technology as one vehicle to such improvement. These people do not stop learning, stop dreaming, stop communicating. They are the ones who may move slowly at the present time but they will be ready to accelerate when the opportunity comes. They must not be forgotten in the world community of scholars and practitioners in educational technology.

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THE DIFFUSION AND IMPLEMENTATION OF EDUCATIONAL TECHNOLOGY IN DEVELOPING NATIONS: CROSS CULTURAL COMPARISONS OF INDONESIA, CHILE AND PERU

Most research studies begin with curiosity--curiosity about an observation, an experience or a convergence of isolated factors. Most research studies do not begin from scratch--somewhere, sometime, someone has thought about the question and has explored it to some degree. Most research studies begin with hypotheses, probably not fully developed or stated in classic experimental fashion. Most research studies have a general idea about procedures to follow in exploring a question but changes are usually made en route, especially in the social sciences where people are involved. Most research studies expect to reveal something new; there is anticipation of a contribution even though some report "no significant differences" or have to reject the original hypotheses. These were the conditions that preceded this study. They were manifested in several ways.

I was curious about the status of educational technology in three countries where I had spent a great deal of time over the past thirty years: my first contact with Indonesia was with a graduate student from that country in 1958 and I have worked there almost every year since 1979 for periods of three weeks to three months. In 1963, I was a Senior Fulbright Lecturer in Chile for about nine months and in 1975 I served on a Fulbright team in Peru for three months. I have returned to Chile and Peru on other occasions since my first appointments and have continued to be in communication with professional colleagues in each of these countries over the years. I began to wonder if the field of educational technology had made any progress in those countries (and, incidently, if my contributions had made any difference). I was curious about the cross-cultural similarities and differences between Indonesia and the two Latin American republics. Developing nations are often grouped together and are treated as one Third World unit. I wondered if there are similarities and differences in educational technology as it is practiced in each country. I wondered if educational technology even exists and the nature of its activities. If educational technology has been adopted in various sectors of the society, what are the factors that have facilitated the acceptance and implementation? If it has not been adopted, what are the factors that seemed to hinder its acceptance and implementation? These curiosities coincided with an opportunity for a research leave from my University and invitations to apply for a Fulbright award for research in the American Republics. I was fortunate to have both applications approved.

When a person begins to focus on a research question (or almost any inquiry for that matter) it seems that all of a sudden new information becomes visible. An Indonesian educational technologist, Radikun, had received support from UNESCO in 1984 to study the growth and development of the field in his country. He had interviewed important persons in the United States, the United Kingdom, and Indonesia who had been associated in some way with the development of the field in his country. Tape recordings of all 37 interviews were available and constituted a major resource. Two Chilean educational technologists, Arturo Kotesky and Patricio Calderon, had written an article in 1983, "Development of Educational Technology in Chile," and a specialist from the Multinational Project on Educational Technology, Clifton Chadwick, who was active in the project from Santiago, provided the names of more than twenty professionals who are active in the field. A visit to Florida State University revealed the dissertation of Cassandra Fletcher, Educational Technology in Peru, 1968-1980: A Case Study of Diffusion of an Innovation Within a National Education System (1984). Each of these resources offered extensive reliable information for this study. Each source also provided the continuity needed between the researcher's first contacts with the country and the current state of the field's development.

Beyond the curiosity about the current status of the field was a series of hypotheses about the conditions that facilitate the implementation of educational innovations. In this case, educational technology was the innovation. In 1976 the researcher published an article: "Creating the Conditions for Change" in which seven "conditions" were posited as necessary for institutional change to occur. Since that time, through experience and through review of the literature, those conditions (and one additional condition) appear to be valid. This study offered the opportunity to further test the conditions in a cross-cultural context. Each condition seemed to hold true for North American Educational institutions, but what about other areas of the World?

Those conditions are: dissatisfaction with the status quo; incentives/rewards; knowledge/skills; resources; time; leadership, commitment; and participation.

Out of this curiosity, background information, and hypotheses about conditions that facilitate the implementation of educational innovations, I generated a series of objectives that I wanted to attain in the hope that I could gain an understanding about the current status of the field in three developing nations and perhaps come up with some generalizations about conditions of change that could be used in other contexts.

Objectives of the Study

1. To determine the extent of educational technology presence in each country. Where are the centers of activity? Who leads them? How long have they been in operation? What do they do? What changes have occurred over the years? Do they appear to be secure for the foreseeable future?
2. To identify the networks, if any, through which the concepts of educational media and technology have been disseminated. Who are the opinion leaders? Are they associated with the primary nodes of the networks? Are people associated with one agency, program or organization more like to be the source of innovative ideas and responsible for spreading those ideas throughout the country? Are there format channels, such as professional associations, publications or meetings, through which educational technologists communicate? Are there organizations that assume dissemination responsibilities for the nation? Do any social networks exist among opinion leaders and gatekeepers?
3. To determine reasons for acceptance (and rejection) of educational technology where it has been introduced. Also of interest is any change that may have occurred between initial acceptance and later rejection. Why did the change occur? To what extent did financial support determine acceptance or lack of support, rejection? What factors are responsible for continuation?
4. To test a series of hypotheses regarding conditions that facilitate or hinder the implementation of educational innovations, specifically, educational technology. The premise is that the presence of eight conditions is necessary to implement change once an innovation has been introduced and adopted. The presence of all eight conditions would indicate high probability of sustained implementation. Reduction of the conditions would lessen the probability of continuation.

Research Procedures

To approach these objectives and the related questions required direct primary data and those data can be obtained mostly from people in the countries being studied and literature that exists only in each country. A combination of research methods must be used: historical methods help to determine the "then and now" comparisons that are necessary to view development of the field over time. In this study, a 25 year period is used; case study methods probe institutional dynamics and this study is primarily an inquiry into organizational acceptance and application of educational technology; and descriptive methods permit individual expressions of experience, observations, and interpretations. Each of these methodologies contribute to the over all data gathering procedures and each provides a different perspective on the same questions.

Translating research methodologies into actual data gathering mechanisms is where ideal and practical approaches part company. After 25 years, where are the people you once knew? Who are the active professionals currently--and where you find them? What networks exist, if any, and how do you tap into them? Where is the literature that does not find its way into libraries?

The key to most of these questions is the network which the researcher has built-up over the years. By maintaining contact with individuals in the countries being studied, there are initial points of contact. From those points come others. For example, the 40 or so Syracuse University graduates in Indonesia are obvious starting points; a professional colleague who worked in the field in Chile for almost 15 years can name people who ought to be interviewed; and the Fulbright Commission office in Peru has sponsored half a dozen U.S. educational technologists to teach and study there over the past 15 years and their names are known. With such networks, the first phase of contacts begins and from that first wave comes a flood of additional names of people to contact and interview. In each country, the time expired before the list of names was exhausted.

Data Gathering

The primary source of information for this study was individual educational technologists and other educators who were interviewed by the researcher. Using a structured interview based on the objectives of the study, people were queried about the state of the field and their specific activities in relation educational technology. Most of the interviews occurred in the work place so it was often possible to see special facilities and to meet other people, some of whom were interviewed. During the interviews, each person was asked about reports, evaluations, published materials and other written matter that might provide further insight into the development of the field in that country. These individuals, their colleagues, and the literature that they identified provided the bulk of the data for this study.

There were surprise resources such as the 37 tape recordings which an Indonesian researcher had made in 1984. These recording focussed on the development of educational technology in that country and featured people from the United States, Great Britain, and Indonesia who had participated in that development over the years. Reports and evaluations of various USAID-sponsored projects were found in a file at the USAID office in Jakarta. Both of these resources added useful dimensions to the study. In Chile, the files of a researcher contained copies of reports on the development of educational technology prepared for the Council of Rectors in 1978. In Peru, a Professor who had studied educational technology in the United States, had saved many important policy papers regarding the role of educational technology in higher education in this country. It is doubtful that such information is available elsewhere. The only Spanish-language journal in educational technology, Revista de Tecnologia Educativa, contained many articles written by Chilean and Peruvian authors about experiences in their countries. As a member of the Editorial Board, the researcher possesses most of the back issues. Not many libraries in Chile or Peru can locate all the issues. Discovery of REDUC, a Latin American network of educational information, similar to ERIC, provided a comprehensive database of literature in Spanish that is not found anywhere else in the world. Many of these sources would not have been found outside the country. They served as additional data sources for the study.

Findings

There are findings that are specific to each country and there are findings that are generalizable across all three countries studied. First, the general findings.

1. Educational technology is more of a movement than a field. Local definitions are emerging and they tend not to be North American definitions. The characteristics of a profession are not yet observable: a strong national professional association; high level of communication among practitioners; a body of research; standards for professional training; a code of ethics--none of these elements appear to be sufficiently strong in the three countries studied to say that educational technology is a field. The definitions and perceptions of the field are even more diffuse. The dominant perception is that educational technology equals hardware; that it is a mechanistic invention of the more developed world that is being thrust upon the developing nations; that it is more interested in systems than with people; and that it is contrary to local social-cultural values.

2. Efforts to transfer North American versions of educational technology have been met with some resistance if not hostility usually based on socio-cultural conflicts. The perceived nature of educational technology is that it is revolutionary and requires major changes of organizational behavior, especially in the schools. Such change is viewed as cataclysmic and inappropriate for people who have defined the nature of education for their own people.

3. Even with the cautions, there is an emerging group of people who say they are educational technologists even though they have no formal training in the field. Most of these individuals are computer specialists who demonstrate the same zeal as media specialists did two decades before. They are more numerous and more pervasive than any of the earlier advocates of educational technology. They are found mostly in post-secondary institutions, private schools, business and industry, and government.

4. Many of the people who were trained in educational technology are well-placed in positions but are not doing what they were trained to do. They have become administrators, managers, and government officials and tend not to serve in the schools. Apparently their knowledge and skills have some value in other sectors.

5. There are networks of people in the field of educational technology. Most of the networks seem to follow patterns of university training. For example, in Indonesia, there is an active network among educational technology graduates from Syracuse University; in Peru, there is a network among graduates of Florida State University; and in Chile, there is a combination of graduates from Florida State University, Teachers College (Columbia University) and Pennsylvania State University. Other networks tend to be at job levels, e.g., higher education, medical schools, business and industry trainers, and so forth. People who are working in the field seem to look to North America for trends, new ideas, and new products. There is evidence of assistance from Japan, Germany and The Netherlands in each of the countries studied. Most of such assistance is in the form of products.

6. The reasons for acceptance of educational technology are closely related to the conditions that facilitate change. There has been leadership. One person or one agency championed the diffusion effort. In some cases the original leader trained successors thus continuing the original program; in other cases, the departure of the leader led to decline of the organization or movement. In Indonesia, Yusufhadi Miarso and Setijadi promoted that acceptance of educational technology and helped to establish the Center for Communication Technology (PUSTEKOM). In Chile, Clifton Chadwick, working with the Organization of American States on the Multinational Project on Educational Technology helped to bring together people like Juan Enrique Froemel, Patricio Calderon and Fidel Oteiza to promote the field by establishing a professional organization (ACHTE) and editing a journal (Revista de Tecnologia Educativa). In Peru, a group of Florida State University graduates in the Institute for Research and Development in Education (INIDE) and a group in the Center for Educational Television in the Catholic University were the forces that influenced the early acceptance of educational technology in that country. In almost all these cases there were resources in the form of money, personnel, equipment, and technical services from external sources that facilitated the acceptance and implementation of educational technology. In Indonesia, USAID sponsored a multiyear program; UNICEF funded television programming; and the World Bank provided loans for further development of the field. In Chile and, to a lesser extent, in Peru, the Organization of American States through its Multinational Project on Educational Technology diffused the concept of the field throughout Latin America. The Fulbright Program in Peru, and to a lesser extent in Chile, provided educational technology resource people to work with leaders within the countries. The government of Japan helped to provide television equipment and support services to the Catholic University in Chile and the Konrad Adenaur Foundation from Germany helped to build and equip a complete television facility at the Catholic University in Peru.

Another reason for acceptance and implementation has been the perception of modernization on the part of educational and government leaders. Using the Western model of problem-solving through technology, many countries purchased communication hardware that symbolized progress. It could be seen and touched. It was the same equipment that was being used in the more developed nations and therefore conferred status on the owner. Little thought was given initially to the software or materials required to use it or to the methods of utilization. When time came to demonstrate some of these new acquisitions, it was poorly done and at such expense that cost questions began to be asked.

Still another reason for acceptance and implementation was the promise of providing equal access to educational opportunity. The success of mass media in education in other countries and the visible applications in such innovative organizations as the British Open University, caused leaders faced with educational problems a potential solution to local concerns. Technology was a component of innovative educational programs in other countries; why not in "our country"? It offered a promise that no other reform could make in such a short time.

7. The reasons for the rejection of educational technology are derived from the reasons for acceptance. The lack of leadership seemed to bring about rejection or discontinuance. Sometimes the departure of a leader led to demise of a project and consequent reduction of educational technology's influence. The lack of money at the end of a sponsored project often led to substantial reductions and eventual termination of a program that was once considered to be viable and visionary. The lack of equitable access to the resources provided by educational technology created perceptions of elitism; that is, the use of media and technology was most often focused on the "lighthouse" schools and colleges. Finally, one of the most frequently mentioned factors for rejection in all of the countries studied was lack of understanding on the part of decision-makers. Further elaboration revealed the fact that there was not full comprehension of educational technology--what it is, how it works, and its potential benefits.

8. Most of the conditions that facilitate change were present in each country: dissatisfaction with the status quo; the need for knowledge and skills by the users; the need for resources; the need for leadership; and commitment to the innovation. However, the other conditions were not as strong in some of the countries. The need for rewards or incentives was weak in Chile and Peru but strong in Indonesia. Participation in the implementation of educational technology was weak in Chile and Indonesia but strong in Peru. One could speculate on the reasons for the strengths and weaknesses of the conditions but this analysis is best saved for another paper.

Conclusions

Educational technology is alive but not so well in Chile, Peru and Indonesia. There are many diverse applications of media and instructional development in various sectors of each society but no unifying concept. Most of the principles and practices that are evident have been transferred from the more developed countries of the world. A major barrier to acceptance of educational technology is the lack of understanding on the part of decision-makers. Advocates for the field have not been able to penetrate the thinking of those who make educational decisions. However, there are professionals in the field in each country; there are university-level courses and programs to prepare professional personnel; there are publications in the local languages that contain contemporary concepts about the field; and there are networks through which people communicate about new developments and applications of educational technology.

Educational technology is being defined (and must be defined) in the cultural context of which it is a part. When the manifestations of the field are observed in developing nations, they are often interpreted as cultural and technological imperialism of the more developed countries. Basic media (hardware and some software) and instructional design, development and evaluation procedures can be borrowed from other settings but ultimately they must emerge as indigenous innovations that are uniquely fitted to the local society and culture.

The conditions that facilitate the implementation of education technology in Chile, Peru and Indonesia are: (1) dissatisfaction with the status quo; (2) knowledge and skills of the users; (3) resources to do the job; (4) leadership to support and direct the effort; and (5) commitment to accomplish the goals. Less important conditions seem to be: (6) the need for rewards or incentives; (7) time to prepare for the task; and (8) participation in the process of implementation. The conditions vary with the country and with the nature of the innovation.

For me, the study confirmed the development of educational technology in each of the countries studied but the extent of the development was somewhat disappointing. I am not the first to make this observation.

> "For more than a hundred years much complaint has been made of the unmethodical way in which schools are conducted, but it is only within the last thirty that any serious attempt has been made to find a remedy for this state of things. And with what result? Schools remain exactly as they were."
>
> The Great Didactic of John Amos Comenius 1632

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THE DIFFUSION AND ADOPTION OF EDUCATIONAL TECHNOLOGY IN CHILE

QUESTIONNAIRE

Purpose

1. To determine the extent of educational technology adoption in education settings in Chile since 1963.

2. To determine the networks that have been used to diffuse the concepts of educational technology in Chile.

3. To determine reasons for acceptance of educational technology.

4. To determine the conditions that have facilitated or hindered the adoption of educational technology.

5. Eventually, to compare the extent, patterns and conditions in Chile with other developing nations.

Instructions

Please answer as completely and frankly as possible. Your responses will not be identifies with your name. If a question reminds you of other information that might be useful in the study, please include it. Thank you.

Don Ely

1. What has been your association with the field of educational technology? (e.g., I am a lecturer; I use it in my work; etc.)

2. Are you now "active" in the field, at least part of the time? (e.g., Yes, it is my field of employment; no, I have changed my work and no longer consider myself to be in the field; etc.)

3. When (what date) did you begin working in the field?

4. Have you had professional preparation for work in the field? (e.g., Yes, I have a degree from Universidad Trujillo; no, I have learned about the field on the job.)

5. Would you say that you are or have been:
   a. a promotor or innovator (presents new ideas)? ___
   b. a facilitator (tries to help even when not asked)? ___
   c. a resource person (helps when asked)? ___
   d. an interested bystander (neither supports or hinders)? ___
   Check (X) all that apply.

DIFFUSION AND ADOPTION

6. Please describe some of the projects or programs in which you have been involved and whether they have continued or have ended.

7. Who are the people with whom you communicate in the field of educational technology?

8. Where would you say the centers of activity in educational technology are located in Chile? Where are they and who leads them?

9. Would you please name 3 Chilean people whom you believe are leaders of the educational technology movement in Chile.

10. Would you please name one (or more) foreign nationals who have had strong influence on the educational technology movement in Chile.

11. Give any reasons you can think of that have helped educational technology to be accepted in places where it is successful. (e.g., money was available, there was a strong leader, training was given, etc.)

12. Give any reasons you can for rejection of educational technology in places where it was considered but not adopted. (e.g., objectives were uncertain; no rewards for participation, no leadership, etc.)

THANK YOU FOR YOUR HELP WITH THIS STUDY. DPE

La difusión e implementación de la tecnología educativa en Chile

cuestionario

Objetivos:

1. Determinar el grado de implementación de la tecnología educativa en el campo educacional chileno desde 1963.

2. Determinar el tipo de conecciones usadas para difundir el concepto de tecnología educativa en Chile.

3. Determinar los motivos para la aceptación de la tecnología educativa.

4. Determinar las condiciones que han facilitado o impedido la adopción de la tecnología educativa.

5. En general, comparar el grado de implementación, los modelos y las condiciones chilenas con otros países en desarrollo.

Instrucciones:

Haga el favor de contestar este cuestionario en la forma mas completa y honesta posible. Sus respuestas se mantendrán anónimas. Si alguna pregunta le sugiere información que no ha sido incluída en este cuestionario, le agradecería mucho si pudiese incluirla. De antemano, muchas gracias.

Don Ely

1. ¿Cuál ha sido su asociación con el campo de la tecnología educativa? (Ej: soy catedrático; la uso en mi trabajo; etc.)

2. ¿Está actualmente ejerciendo en el campo educacional, al menos parte del tiempo? (Ej: Sí, es mi campo profesional; no, he cambiado de trabajo y no me considero parte activa del campo educacional; etc.)

3. ¿Cuandó (en que fecha) se integró Ud. al campo educacional?

4. ¿Ha tenido Ud. preparación profesional para trabajar en el campo educacional? (Ej: Sí, tengo un título de la Universidad de Trujillo; no, he aprendido acerca de este campo en mi trabajo; etc.)

5. Se considera o ha considerado Ud:
   a. ¿Un promotor o inovador (presenta nuevas ideas)? ___
   b. ¿Un facilitador (trata de ayudar, aún cuando no se le ha pedido ayuda)? ___
   c. ¿Un recurso humano (ayuda cuando se le pide)? ___
   d. ¿Un espectador (no apoya ni impide)? ___

   Marque con una **X** todas las respuestas con las cuales Ud. se identifica.

Difusión e implementación

6. Describa alguno de los proyectos o programas en los cuales Ud. ha colaborado y diga si éstos están vigentes o se han terminado.

7. ¿ Cuáles son las personas con las cuales Ud. se comunica en el campo de la tecnología educativa?

8. ¿ Dónde diría Ud. que se centran las actividades relacionadas con el campo de la tecnología educativa en Chile? ¿ Dónde se encuentran esos centros y quién los dirige?

9. Nombre a 3 chilenos(as) que Ud. considera los líderes del movimiento de tecnología educativa en este país.

10. ¿ Podría Ud. nombrar uno (o mas) extranjeros que han sido de gran influencia en el movimiento de la tecnología educativa en Chile?

11. Nombre las razones que Ud. piensa han contribuido a la aceptación de la tecnología educativa en aquellos países en donde ésta ya es un éxito (Ej: habían recursos económicos disponibles; había un líder; se impartió capacitación al personal; etc.)

12. Nombre cualesquier razón que Ud. piensa que fue la causa para el rechazo de la tecnología educativa en aquellos países en donde se consideró como una posibilidad, pero nunca llego a concretizarse (Ej: los objetivos planteados eran poco claros; no se recompenzó el esfuerzo o participación; no había liderazgo; etc.)

Muchas gracias por su ayuda en la realización de este estudio. DPE

THE DIFFUSION AND IMPLEMENTATION OF EDUCATIONAL TECHNOLOGY IN PERU

Objectives

1. To determine the extent of educational technology adoption in education settings in Peru since 1975.

2. To determine the networks that have been used to diffuse the concepts of educational technology in Peru.

3. To determine reasons for acceptance of educational technology.

4. To determine the conditions that have facilitated or hindered the adoption of educational technology.

5. Eventually, to compare the extent, patterns and conditions in Peru with other developing nations.

QUESTIONS

1. Where would you say the centers of activity in educational technology are located in Peru?

2. Would you please name 3 Peruvian people whom you believe are leaders of the educational technology movement in Peru.

3. Would you please name one (or more) foreign nations who have had strong influence on the educational technology movement in Peru.

4. Give any reasons you can think of that have helped educational technolgy to be accepted in places where it is successful. (e.g., money was available; there was a strong leader; training was given, etc.)

5. Give any reasons you can for rejection of educational technology in places where it was considered but not adopted. (e.g., objectives were uncertain; no rewards for participation; no leaderships, etc.)

THANK YOU FOR YOUR HELP WITH THIS STUDY. DPE

Objetivos:

1. Determinar el grado de implementación de la tecnología educativa en el campo educacional en Perú desde 1975.

2. Determinar el tipo de conecciones usadas para difundir el concepto de tecnología educativa en Perú.

3. Determinar los motivos para la aceptación de la tecnología educativa.

4. Determinar las condiciones que han facilitado o impedido la adopción de las tecnología educativa.

5. Engeneral, comparar el grado de implementación, los modelos y las condiciones peruanas con otras países en desarrollo.

PREGUNTAS

1. ¿Dónde se encuentran centros de actividades relacionadas con el campo de tecnología educativa en Perú?

2.. Nombre a 3 peruanos (as) que Ud. considera los líderes del movimiento de tecnología educativa en Perú.

3. Nombre a uno (o más) extranjeros que han sido de gran influencia en el movimiento de tecnología educativa in Perú.

4. Nombre las razones que Ud. piensa han contribuido a la aceptación de la tecnología educativa en aquellos lugares en donde ésta ya es un éxito. (Ej: habían recursos económicos disponibles; había un líder; se impartío capacitación al personal; etc.)

5. Nombre qualesquier razón que Ud. piensa que fué la causa para el rechazo de la tecnología educativa en aquellos lugares en donde se consideró como una posibilidad, pero nunca llego a concretizarse. (Ej: los objetivos planteados era poco claros; no se recompenzó el esfuerzo o participación; no había liderazgo; etc.)